

APPENDIX E
APPLICATION FOR SITE PLAN REVIEW
MULTI-FAMILY RESIDENTIAL & NON-RESIDENTIAL USES

PLANNING BOARD
NEW LONDON, NH

DATE APPLICATION FILED: _____

APPLICATION FOR:

- Phase I: Concept Site Plan Review
 Phase II: Preliminary Site Plan Review
 Phase III: Final Site Plan Review

NAME OF APPLICANT: Frank Anzalone

ADDRESS: Po. Box 1016, New London, NH

DAYTIME PHONE NUMBER: (603) 526 - 8911 FAX: _____

NAME OF PROPERTY OWNER: New London Barn Playhouse
(If other than applicant)

ADDRESS: Po. Box 9, New London, NH

DAYTIME PHONE NUMBER: (603) 526 - 6710 FAX: _____

LOCATION OF PROPERTY: 84 Main St., New London, NH

TAX MAP/Lot: - 73 - 41 ZONE DISTRICT: Institutional - Theater Zone

DESCRIPTION OF USE(S) OF BUILDINGS & LAND: Seasonal theater, residential,
office and accessory uses

WATER SERVICE: New London/Springfield Water Precinct On-site Water Well

Other: _____

SEWER SERVICE: New London Wastewater On-site Septic System

ROAD(S) PROVIDING ACCESS: Town Road

State Highway Main Street

The Zoning Administrator or Land Use Coordinator can assist applicants to identify whether the following natural resource areas will be affected and in which sub-watershed the property is located.

SHORELAND OR SHORELAND BUFFER IMPACTED? Yes No

WETLAND OR WETLAND BUFFER IMPACTED? Yes No



STEEP SLOPE AREA IMPACTED? Yes No

PROTECTED STREAM(S) OR STREAM BUFFER(S) IMPACTED? Yes No

LOCATED OVER AN AQUIFER? Yes No

CURRENT USE:

Does the proposed Site Plan affect land held in Current Use? Yes No

CONSERVATION EASEMENT:

Does the Site Plan affect land held in a Conservation Easement? Yes No

SURFACE WATER B SUB-WATERSHED:

- | | |
|---|--|
| <input type="checkbox"/> Pleasant Lake - Blackwater River | <input type="checkbox"/> Lake Sunapee |
| <input type="checkbox"/> Little Lake Sunapee/Murray Pond | <input type="checkbox"/> Lyon Brook/Kezar Lake |
| <input type="checkbox"/> Goose Hole Pond | <input type="checkbox"/> Messer Pond/Clark Pond/Kezar Lake |
| <input type="checkbox"/> Otter Pond | |

CERTIFICATION BY APPLICANT

I certify that this Site Plan Review Application, including the supporting plan and documents, has been completed in accordance with the Site Plan Review Regulations of the Town of New London.

I certify that this Site Plan Review Application, including the supporting plan and documents, complies with the standards specified in the New London Site Plan Review Regulations, unless a specific waiver has been applied for and granted by the Planning Board.

I certify that I will continue to comply with the standards specified in the New London Site Plan Review Regulations on an on-going basis.

I understand and agree that if I propose to change the use or layout of the site from the approved site plan that I will contact the Planning Board, or its designee, to see if a new application for an amended Site Plan Review is required.

I agree to obtain all the subsequent Town permits needed for this Site Plan Review Application including the required Certificate of Occupancy Permit before the property can be used.

Further, I agree to comply with all required inspections during construction and to pay for all required inspection services.

In making this application, I agree to permit the members of the Planning Board and its agents to enter upon the subject property for the purpose of inspecting the property for the application.

DATE: _____

SIGNATURE OF PROPERTY OWNER

SIGNATURE OF AGENT FOR PROPERTY OWNER

(Need letter of authorization from property owner)



APPENDIX F: MULTI-FAMILY RESIDENTIAL & NON-RESIDENTIAL USES PRELIMINARY
 SITE PLAN REVIEW CHECKLIST of APPLICATION REQUIREMENTS

#	Application Requirement	Submitted	Not Applicable	Waived by PB
2.a	Application Form			
2.b	Letter of Authorization			
2.c	Abutters List			
2.d	Application Fee			
2.e	Waiver Requests in Writing			
2.f	Site Plan Maps - # as directed by Town Planner			
1	Estimated area & distances & directions of boundaries			
2	Name(s) of owner(s) of record			
3	Abutters list			
4	Site location map			
5	North point, graphic scale, date of preparation & revisions			
6	Zone District(s) lines of demarcation			
7	Name, address & seal of person or firm preparing plans			
8	Preliminary plan of existing & proposed structures			
9	Existing structures - photos from all sides			
10	Proposed structures - architectural style concept & exterior for all proposed buildings & additions building materials			
11	General topography & steep slope areas			
12	Direction of flow of surface water			
13	Groundwater & surface water resources			
14	Rock outcroppings & depth to ledge			
15	Preliminary plan for streets, driveways, parking & sidewalks			
16	Preliminary wastewater treatment plans			
17	Preliminary landscaping plan			
18	Preliminary plans for domestic water supply			
19	Preliminary fire protection plan			
20	Existing & preliminary proposed utility plan			
21	Preliminary outdoor lighting plan			
22	Preliminary sign plan			
23	Preliminary plan for managing surface water drainage			
24	Prelim. erosion & sediment control plan during & after construction			
25	Prelim. plan of the ROW & traveled surface of fronting streets			
26	Preliminary snow storage plan			
27	Preliminary plan for solid waste disposal facility			
28	Prelim. plan for outdoor storage/display of materials/merchandise			
29	Executive Summary to include:			
a	Hours & days of operation			
b	Estimate of normal business traffic			
c	Description of proposed use(s)			
d	Number of employees			
e	Any unusual demand for utility service			

Town of New London
Site Plan Review Regulations
As Amended December 1, 2015

	f	Additional information to clarify proposal			
30		Special impact studies required by PB			

NOTE #1: The numbering of this checklist corresponds with the numbering in the Site Plan Review Regulations for a Preliminary Site Plan Review Application.

NOTE #2: The SPR Regulations must be consulted for the details of the items contained in this checklist.



APPENDIX G - MULTI-FAMILY RESIDENTIAL & NON-RESIDENTIAL USES
 FINAL SITE PLAN REVIEW CHECKLIST of APPLICATION REQUIREMENTS

#	Application Requirement	Submitted	Not Applicable	Waived by PB
2.a	Application Form			
2.b	Letter of Authorization			
2.c	Abutters List			
2.d	Application Fee			
2.e	Waiver Requests in Writing			
2.f	Site Plan Maps - # as directed by Town Planner			
	1	Boundary survey & lot area		
	2	Site location map		
	3	Name(s) of owner(s) of record		
	4	Abutting landowners within 200 feet of the property line		
	5	North point, graphic scale, date of preparation & revisions		
	6	Zone District(s) lines of demarcation		
	7	Name, address & seal of person or firm preparing plans		
	8	Shape, size & location of existing & proposed structures		
	9	Existing structures – photos from all sides		
	10	Proposed structures - conceptual floor plans & elevations		
	11	Topography at 2' intervals & steep slope areas existing & proposed grades & drainage systems		
	12	Groundwater & surface water resources		
	13	Rock outcroppings & depth to ledge		
	14	Final plan for streets, driveways, parking spaces, & sidewalks		
	15	Final wastewater treatment plans		
	16	Final landscaping plan		
	17	Final plans for domestic water supply		
	18	Final fire protection plan		
	19	Existing & final proposed utility plan		
	20	Final outdoor lighting plan		
	21	Final sign plan		
	22	Final plan for managing surface water drainage		
	23	Final erosion & sediment control plan during & after construction		
	24	Final plan of the ROW & traveled surface of all fronting streets		
	25	Final snow storage plan		
	26	Final plan for solid waste disposal facility		
	27	Final plan for outdoor storage/display of materials/merchandise		
	28	Executive summary		
	a	Hours & days of operation		
	b	Estimate of normal business traffic		
	c	Description of proposed use(s)		
	d	Number of employees		
	e	Any unusual demand for utility service		
	f	Additional information to clarify proposal		
	30	Special impact studies required by PB		

Town of New London
Site Plan Review Regulations
As Amended December 1, 2015

NOTE #1: The numbering of this checklist corresponds with the numbering in the Site Plan Review Regulations for a Final Site Plan Review Application.

NOTE #2: The Site Plan Review Regulations need to be consulted for the details of the items contained in this checklist.



APPENDIX H
SUGGESTED FORM OF ACCEPTABLE IRREVOCABLE LETTER OF CREDIT

Board of Selectmen
Town of New London
New London Town Offices
375 Main Street
New London, N.H. 03257

Dear Town Officials:

RE: _____ Site Plan

By this document, the _____ Bank (hereinafter "issuer") hereby issues an irrevocable letter of credit in the amount of \$ _____ to the Town of New London on behalf of _____ (hereinafter "developer"). This irrevocable letter of credit is issued to guaranty completion of all improvements required by the New London Planning Board and the Town of New London Site Plan Review Regulations in conjunction with a site plan entitled " _____ ", dated _____, prepared by _____, and approved by the New London Planning Board on _____.

It is understood that the improvements guaranteed by this irrevocable letter of credit include but are not limited to the following:

- 1.
- 2.
- 3.

It is agreed and understood by the issuer of this letter of credit that it shall be issued for a period of _____ months. If all improvements guaranteed by this letter of credit are not completed by _____ (date) and if an Certificate of Occupancy Permit indicating completion of all improvements has not been issued by the Town of New London Board of Selectmen, then this letter of credit shall be automatically considered to have been called and without further action by the Town of New London or its Board of Selectmen, the _____ Bank shall forward a check in the amount of \$ _____ to the Treasurer of the Town of New London. The funds so forwarded to the Town Treasurer shall be used exclusively for the purpose of completing the improvements which are guaranteed by this letter of credit. Any funds not needed by the Town to complete improvements required by the site plan referred to above shall be returned to the _____ Bank.

(Signature of Bank Official)

Date: _____

I have read this letter of credit and agree to its terms.

(Signature of Developer)

New London Barn Playhouse
84 Main Street
Po. Box 9
New London, NH 03257

September 27, 2019

Town of New London
84 Main Street
New London, NH 03257

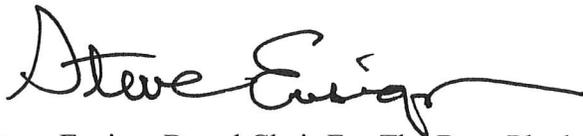
Re: Barn Playhouse
84 Main Street
Map 73, Lot 41

To Whom It May Concern,

We, the undersigned, own the lot referenced above on Main Street, New London, NH. Recently we have decided to construct additions and Renovations.

To facilitate this, we hereby authorize Frank Anzalone, AIA of Frank Anzalone Associates and Will Davis of Horizons Engineering to represent us in whatever applications, hearings and/or discussions necessary to obtain a building permit.

Thank you,



Steve Ensign, Board Chair For The Barn Playhouse



Handwritten scribbles or faint markings at the bottom of the page.

Frank Anzalone Associates
Architects and Planners

P.O. Box 1016
New London, NH 03257
Phone 603.526.8911
Fax 603.526.8922

Project: BARN PLAYHOUSE
Project Number: _____
Date: 9/27/19
Drawn By: FA Page _____ of _____

APPLICATION FEE - PLANNING BOARD
FINAL SITE PLAN
REVIEW

ADVERTISING \$ 56.00

FINAL SPR FEE \$ 200.00

\$75.00/ 1000 SQ.FT. \$ 150.00
BLDG.
2573 SQ.FT / 1000 =

(15) ABUTTERS @ \$4.00 EA = \$60.00

\$ 466.00

TOWN OF NEW LONDON
SELECTMEN'S OFFICE
OCT 01 2019
RECEIVED

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Frank Anzalone Associates
Architects and Planners

September 30, 2019

Town of New London
375 Main Street
New London NH 03257

To the New London Planning Board,

The purpose of this letter is to request waivers from the New London Planning Board regarding an application for New London Barn Playhouse 84 Main Street site plan review. The items we are asking to be waived are as follows...

- Landscape Open Space Percentage
- Minimum number of Off Street Parking Spaces
- Surface Water Drainage

If you should have any further questions regarding any of the items listed above, please do not hesitate to contact me here at the office.

Best Regards,



Frank Anzalone, AIA



Frank Anzalone Associates
Architects and Planners

September 27, 2019

Town of New London
Planning Board
375 Main Street
New London, NH 03257

Re. 84 Main Street – Site Plan Review
Tax Map/Lot: 73-041-000

Dear Planning Board,

On behalf of The Barn Playhouse we are pleased to submit the enclosed application materials for Final Site Plan Review.

The project includes the addition of first floor bathrooms, lower level bathrooms, an elevator, renovating the existing lower level changing rooms, and expansion of the existing front porch to the existing Barn Playhouse. There are no changes planned for the interior of the Barn Playhouse.

The existing red house is to have an office expansion on the first floor, towards the rear of the structure and a 2,285 Sq. Ft. addition. The addition will be used as a rehearsal space. The lower level of the addition will be used as scene shop.

The proposed site improvement associated with this work will be walking paths, site lighting, parking, drainage features, landscaping and utility connections.

Please find the following application materials enclosed:

Application form
Authorization Letter
Abutters list and map
Waiver request
Survey
Site Plan, building floor plan and conceptual exterior elevations
Site lighting plan
Erosion control plan
Site photos



The following describes how the proposed project complies with the design standards listed in the Site Plan Review Regulations, Article VI:

- A. Zoning and Other Requirements: the proposed work is located on a site within the institutional theater zoning district. The proposed addition and renovation comply with the New London Zoning Ordinances.
- B. Site characteristics: the proposed expansions will be one story with a basement level. The existing parking will be expanded and regraded. Parking lighting will be added. Pathways for pedestrians and landscaping will be added.
- C. Landscape open space: please refer to the site plans for landscaping details. The proposed landscaping will provide a buffer for the residential zone. Additional trees will be planted for the proposed parking spaces.
- D. Multi-family structures, recreation area, N/A
- E. Solid waste: A waste collection area has been provided in the parking behind the Rehearsal Barn. Dumpsters will be screened with a fence and gate.
- F. Parking, loading and safety: The current parking area accommodates about 45 cars, the proposed parking will accommodate 54 cars, three of these spaces will be accessible with the required clearances. The parking spaces will be 9'x19' with a 24' wide drive isles.
- G. Water drainage: A detailed drainage report has been included with this application. We have attempted to design the Stormwater detention and treatment pond to comply with Article VI, G. Water Drainage of the Site Plan Review Regulations as required by the Site Plan Review Regulations since the total project proposes over 2,500 sf of new impervious surfaces. Landscaping improvements and Permeable [porous] pavement has been utilized to help reduce the stormwater flow. It is proposed for on-site sidewalks, the terrace/patio area, and for the [3] ADA parking spaces. A micropool extended detention pond has also been utilized to meet Water Quality Volume requirements and reduce the peak 'off-site' flow rates leaving the site for the 1, 2, 10, 50, and 100-yr storm events.

All requirements of the Subdivision Control Regulations regarding drainage were not achievable and therefore a waiver is requested. Due to the limiting site soils and shallow Seasonal High Water Table (SHWT) at the location of the proposed stormwater pond and the largest treatment feature, the Stormwater Recharge Volume requirement could not be met. However, where feasible throughout the site, low impact development (LID) features including infiltration drip edges and porous paver sidewalks were incorporated to achieve the maximum Stormwater Recharge Volume for the site.

- H. Outdoor lighting: refer to site lighting plan.
- I. Signs: at this time, there is no proposed change in signage.

- J. Snow storage: the barn is a seasonal use, therefore snow will be removed on walkways and the parking area as required to provide access for emergency services and routine building walk throughs. The required 20% snow storage is 4,113 Sq. Ft. the provided snow storage is 8,630 Sq. Ft.
- K. Snow hazards: no vehicles will be parked near the structure where falling snow may occur. The majority of the exits are located in areas protected by roofs above.
- L. Consideration for adjacent lands: the proposed work will not have a negative effect on neighboring property values. The location and heights of the proposed additions are consistent with the current use and will not interfere or discourage the appropriate use of adjacent land.

- M. Harmonious development: the current use, zoning and the proposed additions shall provide an aesthetically pleasing continuity to the existing structures and neighboring properties.

- N. Natural resources: a storm water detention pond is being added to reduce storm water discharge from this site.
- O. Undesirable features: no noise or other pollution is anticipated as a result of the proposed project.
- P. Sediment and erosion control: refer to erosion control plan.
- Q. Fire protection: the proposed additions will have a fire sprinkler suppression system and alarm notification system as required by the NH Building Code, NFPA 101, Life Safety Code, NFPA 13 Standard for the Installation of the Sprinkler Systems and other applicable state codes and rules.
- R. Noise: no obnoxious noise or use is proposed.
- S. Screening of heavy vehicles and equipment: there will be no heavy equipment on site after construction.
- T. Outside displays: there will be no outside displays.

The proposed hours of operation will not change from the current times and shows. We do not anticipate any unusual utility demand for this site.

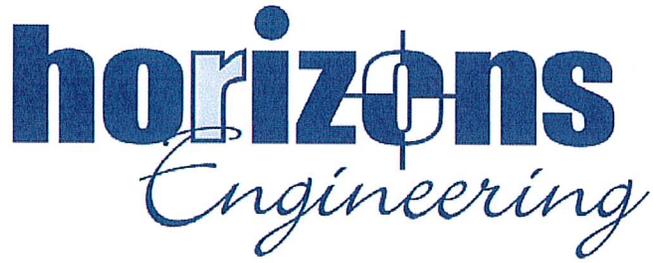
We look forward to meeting with the Board to present and discuss this project. Please contact us if you have any questions or concerns.

Thank you,



Frank Anzalone, AIA

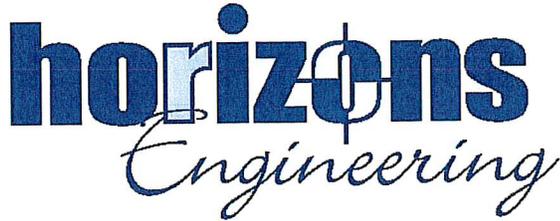




**TOWN OF NEW LONDON
DRAINAGE REPORT**

**NEW LONDON BARN PLAYHOUSE
New London, New Hampshire**





176 NEWPORT ROAD, PO BOX 1825 • NEW LONDON, NH 03257 • PHONE 603-877-0116 • FAX 603-526-4285 • www.horizonsengineering.com

**TOWN OF NEW LONDON DRAINAGE REPORT
FOR
NEW LONDON BARN PLAYHOUSE**

NEW LONDON, NH

OCTOBER 2019

**PROJECT NUMBER 18865
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Horizons Engineering, Inc.**

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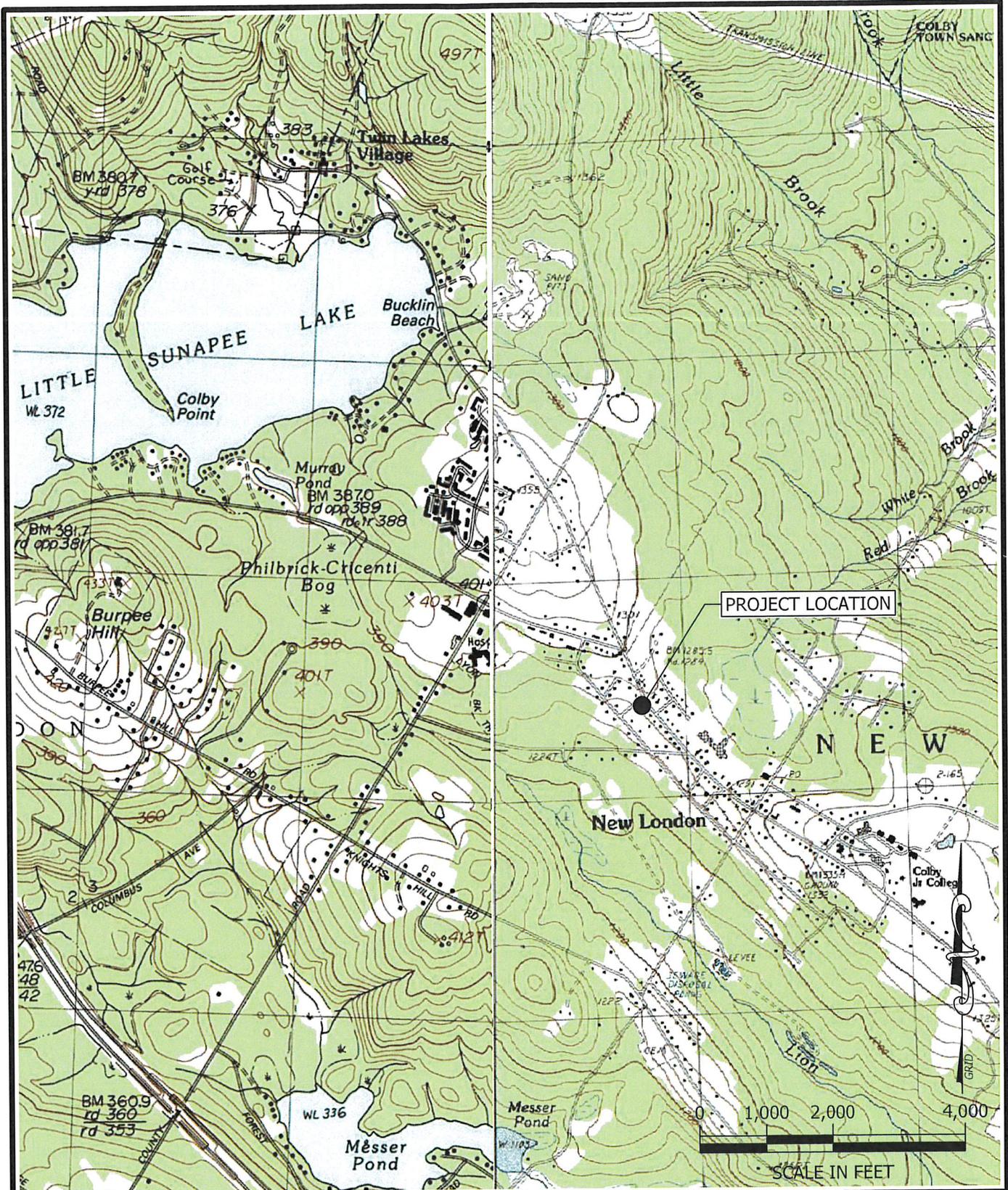
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SECTION 1.0 PROJECT INFORMATION NARRATIVE

1.1 USGS Location Map

TOWN OF NEW LONDON
SELECTMEN'S OFFICE
OCT 01 2019
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horizons
Engineering

Littleton NH • New London NH • Newport VT • Pomfret VT
603-444-4111 603-877-0116 802-334-6434 802-457-3151

**NEW LONDON BARN
PLAYHOUSE, INC.**

PLAYHOUSE SITE PLAN
NEW LONDON, NEW HAMPSHIRE

USGS LOCATION MAP

PROJECT #:
18865

ENGIN'D BY:
-

DRAWN BY:
CEW

DATE:
9/30/2019

1.2 Project Narrative



1.2.1 Project Summary

New London Barn Playhouse is applying for a Site Plan Review Permit for the construction of a new 2,330 square foot building to the south for rehearsals/production, new interior renovations of the ‘Red House’ and a small renovation and addition to the ‘Barn’, sidewalks, landscaping, parking lot modifications, and drainage features. The project is located on Tax Map 73, Lot 41.

Excavation and fill for building foundation and site work will be required to complete the improvements. New impervious surfaces will include building roofs, bluestone parking areas, and walkways. A large majority of the proposed walkways are proposed pervious walkways. The total disturbance for this work is 46,985 square feet. The total proposed post-project impervious area within the disturbed area is 37,949 square feet. Stormwater from impervious surfaces will be directed to a micropool extended detention pond.

The following table shows the 2, 10, 50 and 100 year peak flow rate comparison at the discharge points.

Table 1.0 – 2, 10 and 50 Year Comparison

Watershed Area Discharge Point	Pre 2 Yr Flow Rate (cfs)	Post 2 Yr Flow Rate (cfs)	Pre 10 Yr Flow Rate (cfs)	Post 10 Yr Flow Rate (cfs)	Pre 50 Yr Flow Rate (cfs)	Post 50 Yr Flow Rate (cfs)	Pre 100 Yr Flow Rate (cfs)	Post 100 Yr Flow Rate (cfs)
Dp 1	2.94	2.67	4.88	4.22	7.70	7.06	9.29	9.25
Dp 2	0.04	0.02	1.10	0.05	0.22	0.10	0.29	0.13
Dp 3	0.53	0.30	0.90	0.52	1.46	0.84	1.77	1.02
OVERALL	3.51	2.99	5.88	4.79	9.38	8.00	11.35	10.40

1.2.2 Existing Site Conditions

The site is located on the west side of Main Street near the intersection of Main Street and Williams Street. The existing site surface is predominately developed area with some areas of trees, landscaped areas, and grass. The project site slopes to the west and southwest towards the western edge of the property. On the southwest corner of the property, a ditch directs stormwater to a catch basin located within the right-of-way along Everett Park Road.

1.2.3 Rainfall Data

Using SCS TR-20, run under HydroCAD Version 10.0 with Type II-24 hour rainfall events, pre- and post-development cover types and drainage paths were modeled to generate peak discharge rates. Rainfall events modeled have intensities described by data provided by the Northeast Regional Climate Center for the geographic location of the project. These data are provided in full in section 1.5 of this report, and are summarized below in **Table 1.2**.

Table 1.2 - Type II, 24 Hour Rainfall Depths for Project Site (43.419°N, 71.991°W)

Rainfall Event	Depth*
2-Year	2.63"
10-Year	3.83"
50-Year	5.58"
100-Year	6.57"

* Rainfall depths from the Northeast Regional Climate Center Extreme Precipitation Tables, <http://precip.eas.cornell.edu>, accessed 1 July 2019, See section 1.5

1.2.4 Peak Runoff Control Requirement

Due to the post-project grading of the site and changes in land cover, stormwater devices were used to attenuate flow in order to meet the Peak Runoff Control requirements. **Table 1.3** summarizes the stormwater runoff peak flow rate for the 10 and 50 year storm events.

Table 1.3 – 10, 50, and 100- Year Comparison

Watershed Area Discharge Point	Pre 10 Yr Flow Rate (cfs)	Post 10 Yr Flow Rate (cfs)	Pre 50 Yr Flow Rate (cfs)	Post 50 Yr Flow Rate (cfs)	Pre 100 Yr Flow Rate (cfs)	Post 100 Yr Flow Rate (cfs)
DP 1	4.88	4.22	7.70	7.06	9.29	9.25
DP 2	1.10	0.05	0.22	0.10	0.29	0.13
DP 3	0.90	0.52	1.46	0.84	1.77	1.02
OVERALL	5.88	4.79	9.38	8.00	11.35	10.40

The proposed site plan proposes new ditches along the expanded parking lot to direct runoff to the proposed stormwater pond. The proposed walkways are pervious pavers to help provide better stormwater peak discharge rates in post-construction conditions as well. The peak rate of runoff for all individual subcatchments is decreased in the post-development condition. For comparison, discharge from the entire site, or all three discharge points combined (OVERALL) will discharge less in the post-development condition than it does in the pre-development condition.

1.2.5 Channel Protection Requirement

New London Subdivision Regulations requires that the receiving waters and downstream wetland channels be protected from erosion and sedimentation resulting from the project development. In order to show no impact to offsite channels, analysis of the proposed drainage system must meet one of the conditions for Channel Protection. Post-construction conditions reduce runoff rates in each subcatchment and overall for the site and meets the New London channel protection requirements.

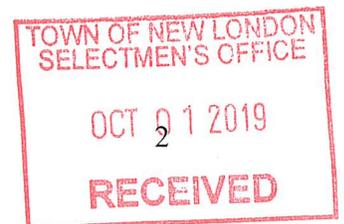


Table 1.4 – Channel Protection Comparison Outlet Points

Outlet point	Pre 2 Yr Flow Rate (cfs)	Post 2 Yr Flow Rate (cfs)
DP 1	2.94	2.67
DP 2	0.04	0.02
DP 3	0.53	0.30
OVERALL	3.51	2.99

1.2.6 Groundwater Recharge Volume

The New London Subdivision Regulations require a portion of the stormwater runoff be infiltrated to protect groundwater resources by reducing the amount of water diverted off-site by the proposed disturbance. The amount of groundwater recharge required is 0.5 (inches) x impervious surface area (square feet) / 12 (inch per square foot). The total required recharge volume is 1,581 cubic feet for this project. An infiltration practice has been included in the proposed design that provides 78.75 cubic feet of groundwater recharge through infiltration. The proposed infiltration drip-edge provides a portion of the groundwater recharge volume where feasible for the site. The proposed pervious pavers also provide groundwater recharge volume through the filter courses and stone reservoir. The pervious pavers provide 1,420 cf of groundwater recharge volume. Therefore, the total groundwater recharge volume provided for the site is 1,495 cf.

**1.3 Extreme Precipitation Tables
(Northeast Regional Climate Center)**



Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.991 degrees West
Latitude	43.419 degrees North
Elevation	0 feet
Date/Time	Mon, 01 Jul 2019 15:59:28 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.50	0.65	0.82	1.02	1yr	0.70	0.95	1.17	1.46	1.81	2.24	2.54	1yr	1.99	2.45	2.83	3.49	4.04	1yr
2yr	0.31	0.48	0.60	0.79	0.99	1.23	2yr	0.85	1.12	1.42	1.75	2.15	2.63	2.98	2yr	2.33	2.87	3.33	3.98	4.57	2yr
5yr	0.37	0.57	0.72	0.97	1.24	1.56	5yr	1.07	1.42	1.79	2.20	2.69	3.26	3.74	5yr	2.88	3.59	4.17	4.91	5.57	5yr
10yr	0.42	0.66	0.83	1.13	1.47	1.86	10yr	1.27	1.70	2.14	2.63	3.19	3.83	4.43	10yr	3.39	4.26	4.93	5.75	6.47	10yr
25yr	0.50	0.79	1.01	1.39	1.84	2.35	25yr	1.59	2.15	2.71	3.31	3.99	4.74	5.56	25yr	4.20	5.34	6.17	7.09	7.89	25yr
50yr	0.57	0.91	1.17	1.63	2.19	2.80	50yr	1.89	2.57	3.24	3.95	4.72	5.58	6.59	50yr	4.94	6.34	7.32	8.31	9.17	50yr
100yr	0.64	1.04	1.35	1.91	2.60	3.35	100yr	2.24	3.08	3.87	4.70	5.60	6.57	7.83	100yr	5.82	7.53	8.68	9.75	10.66	100yr
200yr	0.74	1.21	1.57	2.25	3.09	3.99	200yr	2.67	3.69	4.61	5.59	6.63	7.74	9.31	200yr	6.85	8.95	10.30	11.45	12.40	200yr
500yr	0.89	1.47	1.92	2.78	3.89	5.05	500yr	3.36	4.68	5.83	7.05	8.30	9.61	11.70	500yr	8.50	11.25	12.92	14.16	15.15	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.21	0.32	0.39	0.53	0.65	0.81	1yr	0.56	0.79	0.95	1.27	1.64	1.94	2.28	1yr	1.72	2.19	2.54	2.98	3.25	1yr
2yr	0.30	0.46	0.57	0.77	0.95	1.12	2yr	0.82	1.10	1.29	1.68	2.16	2.55	2.86	2yr	2.26	2.75	3.20	3.84	4.41	2yr
5yr	0.34	0.52	0.65	0.89	1.14	1.33	5yr	0.98	1.30	1.52	1.97	2.48	2.98	3.35	5yr	2.64	3.22	3.74	4.46	5.08	5yr
10yr	0.37	0.57	0.71	0.99	1.28	1.49	10yr	1.11	1.46	1.71	2.20	2.75	3.36	3.78	10yr	2.98	3.63	4.19	4.97	5.66	10yr
25yr	0.41	0.63	0.78	1.12	1.47	1.69	25yr	1.27	1.65	2.01	2.53	3.16	3.92	4.42	25yr	3.47	4.25	4.85	5.73	6.49	25yr
50yr	0.44	0.66	0.83	1.19	1.60	1.85	50yr	1.38	1.81	2.26	2.82	3.49	4.43	4.97	50yr	3.92	4.78	5.42	6.32	7.20	50yr
100yr	0.46	0.69	0.86	1.25	1.71	2.01	100yr	1.47	1.97	2.54	3.24	3.89	4.99	5.58	100yr	4.41	5.36	6.03	6.95	7.95	100yr
200yr	0.47	0.71	0.90	1.30	1.81	2.18	200yr	1.56	2.13	2.86	3.63	4.33	5.65	6.24	200yr	5.00	6.00	6.69	7.63	8.78	200yr
500yr	0.49	0.73	0.94	1.37	1.95	2.37	500yr	1.68	2.32	3.35	4.24	4.97	6.66	7.25	500yr	5.90	6.97	7.63	8.59	9.98	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.29	0.45	0.55	0.74	0.91	1.08	1yr	0.79	1.06	1.21	1.58	1.94	2.50	2.90	1yr	2.22	2.78	3.23	3.84	4.47	1yr
2yr	0.34	0.53	0.65	0.88	1.08	1.24	2yr	0.94	1.21	1.39	1.80	2.30	2.75	3.13	2yr	2.44	3.01	3.51	4.18	4.75	2yr
5yr	0.41	0.62	0.78	1.06	1.35	1.59	5yr	1.17	1.55	1.80	2.28	2.89	3.55	4.15	5yr	3.14	3.99	4.63	5.35	6.05	5yr
10yr	0.49	0.75	0.93	1.29	1.67	1.96	10yr	1.44	1.92	2.22	2.72	3.43	4.31	5.16	10yr	3.82	4.96	5.71	6.49	7.30	10yr
25yr	0.62	0.95	1.18	1.68	2.22	2.62	25yr	1.91	2.56	2.94	3.50	4.37	5.55	6.87	25yr	4.91	6.61	7.61	8.42	9.36	25yr
50yr	0.75	1.14	1.43	2.05	2.76	3.27	50yr	2.38	3.19	3.63	4.24	5.25	6.74	8.54	50yr	5.97	8.21	9.46	10.29	11.31	50yr
100yr	0.92	1.39	1.74	2.51	3.44	4.10	100yr	2.97	4.01	4.49	5.31	6.32	8.20	10.62	100yr	7.25	10.22	11.75	12.59	13.66	100yr
200yr	1.12	1.68	2.13	3.08	4.30	5.14	200yr	3.71	5.03	5.55	6.45	8.06	9.97	13.24	200yr	8.82	12.73	14.58	15.44	16.53	200yr
500yr	1.46	2.17	2.80	4.06	5.78	6.96	500yr	4.99	6.80	7.36	8.36	10.41	12.90	17.74	500yr	11.42	17.06	19.48	20.26	21.30	500yr



**SECTION 2.0 - DRAINAGE CALCULATIONS,
ANALYSIS & DESIGN**

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2.1 Pre-Development Analysis

2.1 Pre-development Analysis

The pre-development analysis included three subcatchment areas labeled Ex-1 through Ex-3 throughout this report, on the drainage plans, and in the HydroCAD report. Three discharge points have been included in the analysis: southwestern catchment area which collects a majority of the site (Ex-1), small subcatchment to the west (Ex-2), and the northwestern subcatchment area (Ex-3). A summary of all three discharge points combined has also been included and noted OVERALL.

A site soils map was generated from the USDA Natural Resources Conservation Service (NRCS) on July 1, 2019. This information can be found in **Section 2.3** of this report. The watershed areas and drainage paths can be found in **Section 3**.



2.1.1 Pre-Development 2, 10, 25, 50, and 100 - Year Storm



EX-3S



Dp3

Dp3

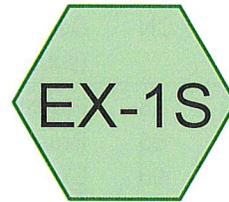


EX-2S



Dp2

Dp2

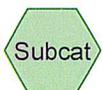


EX-1S



Dp1

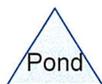
Dp1



Subcat



Reach



Pond



Link

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
21,116	98	Bluestone parking, HSG C (EX-1S, EX-2S, EX-3S)
4,172	65	Brush, Good, HSG C (EX-1S, EX-2S, EX-3S)
7,635	98	Ex. buildings, HSG C (EX-1S)
16,690	71	Meadow, non-grazed, HSG C (EX-1S, EX-2S, EX-3S)
9,211	98	Pavement, HSG C (EX-1S)
850	98	Sidewalk & walkways, HSG C (EX-1S)
1,265	70	Woods, Good, HSG C (EX-1S, EX-2S, EX-3S)
60,939	88	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
60,939	HSG C	EX-1S, EX-2S, EX-3S
0	HSG D	
0	Other	
60,939		TOTAL AREA



Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatc Number
0	0	21,116	0	0	21,116	Bluestone parking	
0	0	4,172	0	0	4,172	Brush, Good	
0	0	7,635	0	0	7,635	Ex. buildings	
0	0	16,690	0	0	16,690	Meadow, non-grazed	
0	0	9,211	0	0	9,211	Pavement	
0	0	850	0	0	850	Sidewalk & walkways	
0	0	1,265	0	0	1,265	Woods, Good	
0	0	60,939	0	0	60,939	TOTAL AREA	

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Type II 24-hr 2-yr Rainfall=2.63"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1S: EX-1S

Runoff Area=49,155 sf 66.92% Impervious Runoff Depth>1.46"
Flow Length=312' Tc=7.1 min CN=89 Runoff=2.94 cfs 5,962 cf

Subcatchment EX-2S: EX-2S

Runoff Area=2,378 sf 2.61% Impervious Runoff Depth>0.39"
Flow Length=198' Tc=6.0 min CN=68 Runoff=0.04 cfs 77 cf

Subcatchment EX-3S: EX-3S

Runoff Area=9,406 sf 62.27% Impervious Runoff Depth>1.31"
Flow Length=168' Tc=6.0 min CN=87 Runoff=0.53 cfs 1,029 cf

Link Dp1: Dp1

Inflow=2.94 cfs 5,962 cf
Primary=2.94 cfs 5,962 cf

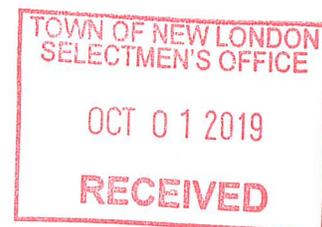
Link Dp2: Dp2

Inflow=0.04 cfs 77 cf
Primary=0.04 cfs 77 cf

Link Dp3: Dp3

Inflow=0.53 cfs 1,029 cf
Primary=0.53 cfs 1,029 cf

Total Runoff Area = 60,939 sf Runoff Volume = 7,067 cf Average Runoff Depth = 1.39"
36.31% Pervious = 22,127 sf 63.69% Impervious = 38,812 sf



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Type II 24-hr 10-yr Rainfall=3.83"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1S: EX-1S

Runoff Area=49,155 sf 66.92% Impervious Runoff Depth>2.49"
Flow Length=312' Tc=7.1 min CN=89 Runoff=4.88 cfs 10,194 cf

Subcatchment EX-2S: EX-2S

Runoff Area=2,378 sf 2.61% Impervious Runoff Depth>0.99"
Flow Length=198' Tc=6.0 min CN=68 Runoff=0.10 cfs 195 cf

Subcatchment EX-3S: EX-3S

Runoff Area=9,406 sf 62.27% Impervious Runoff Depth>2.31"
Flow Length=168' Tc=6.0 min CN=87 Runoff=0.90 cfs 1,812 cf

Link Dp1: Dp1

Inflow=4.88 cfs 10,194 cf
Primary=4.88 cfs 10,194 cf

Link Dp2: Dp2

Inflow=0.10 cfs 195 cf
Primary=0.10 cfs 195 cf

Link Dp3: Dp3

Inflow=0.90 cfs 1,812 cf
Primary=0.90 cfs 1,812 cf

Total Runoff Area = 60,939 sf Runoff Volume = 12,201 cf Average Runoff Depth = 2.40"
36.31% Pervious = 22,127 sf 63.69% Impervious = 38,812 sf

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Type II 24-hr 50-yr Rainfall=5.58"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1S: EX-1S

Runoff Area=49,155 sf 66.92% Impervious Runoff Depth>4.06"
Flow Length=312' Tc=7.1 min CN=89 Runoff=7.70 cfs 16,627 cf

Subcatchment EX-2S: EX-2S

Runoff Area=2,378 sf 2.61% Impervious Runoff Depth>2.10"
Flow Length=198' Tc=6.0 min CN=68 Runoff=0.22 cfs 416 cf

Subcatchment EX-3S: EX-3S

Runoff Area=9,406 sf 62.27% Impervious Runoff Depth>3.86"
Flow Length=168' Tc=6.0 min CN=87 Runoff=1.46 cfs 3,023 cf

Link Dp1: Dp1

Inflow=7.70 cfs 16,627 cf
Primary=7.70 cfs 16,627 cf

Link Dp2: Dp2

Inflow=0.22 cfs 416 cf
Primary=0.22 cfs 416 cf

Link Dp3: Dp3

Inflow=1.46 cfs 3,023 cf
Primary=1.46 cfs 3,023 cf

Total Runoff Area = 60,939 sf Runoff Volume = 20,066 cf Average Runoff Depth = 3.95"
36.31% Pervious = 22,127 sf 63.69% Impervious = 38,812 sf



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Type II 24-hr 100-yr Rainfall=6.57"

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EX-1S: EX-1S

Runoff Area=49,155 sf 66.92% Impervious Runoff Depth>4.96"
Flow Length=312' Tc=7.1 min CN=89 Runoff=9.29 cfs 20,311 cf

Subcatchment EX-2S: EX-2S

Runoff Area=2,378 sf 2.61% Impervious Runoff Depth>2.81"
Flow Length=198' Tc=6.0 min CN=68 Runoff=0.29 cfs 557 cf

Subcatchment EX-3S: EX-3S

Runoff Area=9,406 sf 62.27% Impervious Runoff Depth>4.75"
Flow Length=168' Tc=6.0 min CN=87 Runoff=1.77 cfs 3,722 cf

Link Dp1: Dp1

Inflow=9.29 cfs 20,311 cf
Primary=9.29 cfs 20,311 cf

Link Dp2: Dp2

Inflow=0.29 cfs 557 cf
Primary=0.29 cfs 557 cf

Link Dp3: Dp3

Inflow=1.77 cfs 3,722 cf
Primary=1.77 cfs 3,722 cf

Total Runoff Area = 60,939 sf Runoff Volume = 24,591 cf Average Runoff Depth = 4.84"
36.31% Pervious = 22,127 sf 63.69% Impervious = 38,812 sf

**2.1.2 Pre-Development Full Summary Diagram
10 - Year Storm Event**

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Summary for Subcatchment EX-1S: EX-1S

Runoff = 4.88 cfs @ 11.98 hrs, Volume= 10,194 cf, Depth> 2.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	15,197	98	Bluestone parking, HSG C
*	850	98	Sidewalk & walkways, HSG C
*	7,635	98	Ex. buildings, HSG C
*	9,211	98	Pavement, HSG C
	948	70	Woods, Good, HSG C
	901	65	Brush, Good, HSG C
	14,413	71	Meadow, non-grazed, HSG C
	49,155	89	Weighted Average
	16,262		33.08% Pervious Area
	32,893		66.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	63	0.0280	1.30		Sheet Flow, SHEET-SMOOTH Smooth surfaces n= 0.011 P2= 2.63"
4.3	37	0.0280	0.14		Sheet Flow, SHEET-GRASS Grass: Short n= 0.150 P2= 2.63"
0.9	98	0.0730	1.89		Shallow Concentrated Flow, SHALLOW-GRASS Short Grass Pasture Kv= 7.0 fps
0.0	14	0.0610	5.01		Shallow Concentrated Flow, SHALLOW-PAVE Paved Kv= 20.3 fps
0.4	40	0.0550	1.64		Shallow Concentrated Flow, SHALLOW-GRASS Short Grass Pasture Kv= 7.0 fps
0.7	60	0.0800	1.41		Shallow Concentrated Flow, SHALLOW-WOODS Woodland Kv= 5.0 fps
7.1	312	Total			

Summary for Subcatchment EX-2S: EX-2S

Runoff = 0.10 cfs @ 11.98 hrs, Volume= 195 cf, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

Area (sf)	CN	Description
* 62	98	Bluestone parking, HSG C
* 0	98	Pavement, HSG C
* 0	98	Ex. buildings, HSG C
247	70	Woods, Good, HSG C
1,444	65	Brush, Good, HSG C
625	71	Meadow, non-grazed, HSG C
2,378	68	Weighted Average
2,316		97.39% Pervious Area
62		2.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	198		0.55		Direct Entry, TR-55 MIN



Summary for Subcatchment EX-3S: EX-3S

Runoff = 0.90 cfs @ 11.97 hrs, Volume= 1,812 cf, Depth> 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	5,857	98	Bluestone parking, HSG C
*	0	98	Sidewalk & walkways, HSG C
*	0	98	Ex. buildings, HSG C
	70	70	Woods, Good, HSG C
	1,827	65	Brush, Good, HSG C
	1,652	71	Meadow, non-grazed, HSG C
	9,406	87	Weighted Average
	3,549		37.73% Pervious Area
	5,857		62.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	168		0.47		Direct Entry, TR-55 MIN

Summary for Link Dp1: Dp1

Inflow Area = 49,155 sf, 66.92% Impervious, Inflow Depth > 2.49" for 10-yr event
Inflow = 4.88 cfs @ 11.98 hrs, Volume= 10,194 cf
Primary = 4.88 cfs @ 11.98 hrs, Volume= 10,194 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Summary for Link Dp2: Dp2

Inflow Area = 2,378 sf, 2.61% Impervious, Inflow Depth > 0.99" for 10-yr event
Inflow = 0.10 cfs @ 11.98 hrs, Volume= 195 cf
Primary = 0.10 cfs @ 11.98 hrs, Volume= 195 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link Dp3: Dp3

Inflow Area = 9,406 sf, 62.27% Impervious, Inflow Depth > 2.31" for 10-yr event
Inflow = 0.90 cfs @ 11.97 hrs, Volume= 1,812 cf
Primary = 0.90 cfs @ 11.97 hrs, Volume= 1,812 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



2.2 Post-Development Analysis

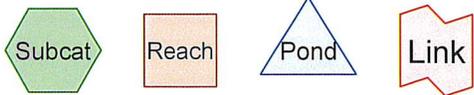
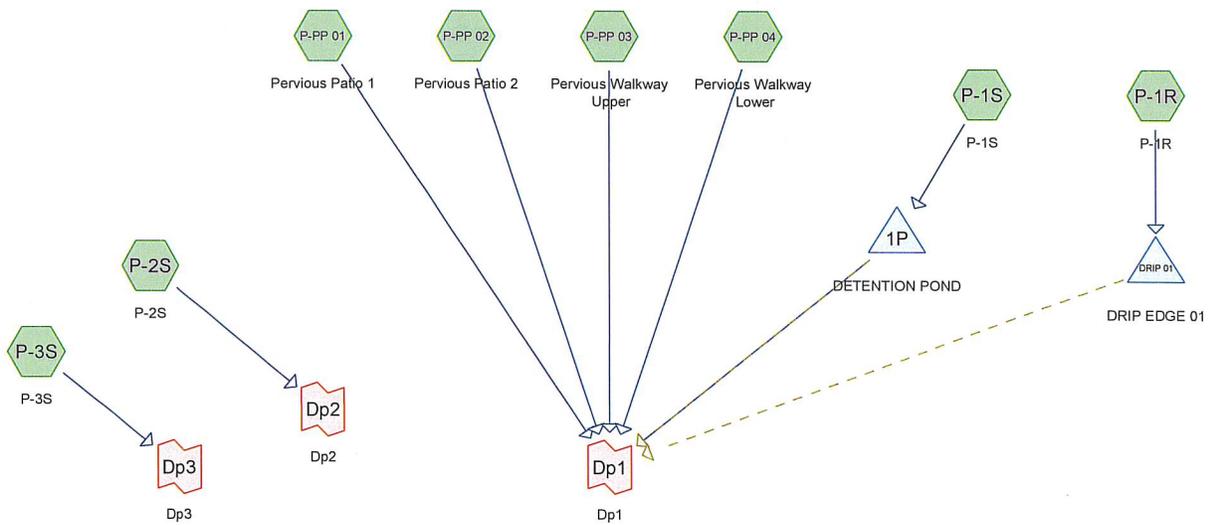
2.2 Post-Development Analysis

The post-development analysis includes subcatchment areas numbered P-1S, P-2S, and P-3S. The proposed drip edge which collects a portion of the new building roof runoff is denoted as P-1R. The proposed micropool extended detention pond is noted as 1P. The discharge points remain unchanged from the pre-development analysis. The same general drainage patterns exist throughout the post-developed site as were pre-existing. However, the proposed walkways are pervious paver walkways. This helps to decrease the amount of impervious area that contributes to peak runoff rates. Two (2) ditches along the western and southern edge of the parking lot have also been included to help capture stormwater runoff and direct to the stormwater pond. The proposed stormwater pond had been designed to reduce peak runoff rates from P-1S for the 1, 2, 10, 25, 50, and 100-year storm events. Minor grading changes have been proposed throughout the site to accommodate new building elevations, three designated handicapped accessible parking spaces, and the two new ditches along the parking area.

For more detailed information on the post-developed area, see attached drainage plans found in **Section 3** and the HydroCAD area listing found in **Section 2.2.1**. A pre- versus post- development comparison flow rate table for the 2, 10, and 50 year storm events can be found in **Table 1.0** in **Section 1.2.1**.



2.2.1 Post-Development 2, 10, 25, 50, and 100 - Year Storm



Routing Diagram for 18865-POST-05
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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
438	65	Brush, Good, HSG C (P-2S, P-3S)
10,957	98	Buildings, HSG C (P-1S)
92	98	Drip Edge, HSG C (P-1R)
6,842	98	Ex. pavement, HSG C (P-1S)
16,283	71	Meadow, non-grazed, HSG C (P-1S, P-2S, P-3S)
815	98	New Building Roof, HSG C (P-1R)
474	98	Paved parking apron, HSG C (P-3S)
4,167	96	Pervious Pavers, HSG C (P-PP 01, P-PP 02, P-PP 03, P-PP 04)
18,272	98	Prop. Bluestone parking, HSG C (P-1S, P-3S)
430	98	Sidewalks & walkways, HSG C (P-1S)
1,067	98	Water Surface, HSG C (P-1S)
555	70	Woods, Good, HSG C (P-1S, P-2S)
60,392	90	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
60,392	HSG C	P-1R, P-1S, P-2S, P-3S, P-PP 01, P-PP 02, P-PP 03, P-PP 04
0	HSG D	
0	Other	
60,392		TOTAL AREA



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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subc: Numt
0	0	438	0	0	438	Brush, Good	
0	0	10,957	0	0	10,957	Buildings	
0	0	92	0	0	92	Drip Edge	
0	0	6,842	0	0	6,842	Ex. pavement	
0	0	16,283	0	0	16,283	Meadow, non-grazed	
0	0	815	0	0	815	New Building Roof	
0	0	474	0	0	474	Paved parking apron	
0	0	4,167	0	0	4,167	Pervious Pavers	
0	0	18,272	0	0	18,272	Prop. Bluestone parking	
0	0	430	0	0	430	Sidewalks & walkways	
0	0	1,067	0	0	1,067	Water Surface	
0	0	555	0	0	555	Woods, Good	
0	0	60,392	0	0	60,392	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	495.75	495.50	10.0	0.0250	0.013	12.0	0.0	0.0



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Type II 24-hr 2-yr Rainfall=2.63"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1R: P-1R	Runoff Area=907 sf 100.00% Impervious Runoff Depth=2.40" Flow Length=21' Tc=6.0 min CN=98 Runoff=0.07 cfs 181 cf
Subcatchment P-1S: P-1S	Runoff Area=48,907 sf 71.14% Impervious Runoff Depth=1.65" Flow Length=356' Tc=6.0 min CN=90 Runoff=3.13 cfs 6,715 cf
Subcatchment P-2S: P-2S	Runoff Area=997 sf 0.00% Impervious Runoff Depth=0.56" Flow Length=124' Tc=6.0 min CN=71 Runoff=0.02 cfs 46 cf
Subcatchment P-3S: P-3S	Runoff Area=5,414 sf 59.99% Impervious Runoff Depth=1.42" Flow Length=83' Tc=6.0 min CN=87 Runoff=0.30 cfs 641 cf
Subcatchment P-PP 01: Pervious Patio 1	Runoff Area=214 sf 0.00% Impervious Runoff Depth>2.19" Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 39 cf
Subcatchment P-PP 02: Pervious Patio 2	Runoff Area=582 sf 0.00% Impervious Runoff Depth>2.19" Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 106 cf
Subcatchment P-PP 03: Pervious Walkway	Runoff Area=663 sf 0.00% Impervious Runoff Depth>2.19" Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 121 cf
Subcatchment P-PP 04: Pervious Walkway	Runoff Area=2,708 sf 0.00% Impervious Runoff Depth>2.19" Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 494 cf
Pond 1P: DETENTION POND	Peak Elev=497.68' Storage=852 cf Inflow=3.13 cfs 6,715 cf Primary=2.67 cfs 6,715 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=2.67 cfs 6,715 cf
Pond DRIP 01: DRIP EDGE 01	Peak Elev=505.82' Storage=70 cf Inflow=0.07 cfs 181 cf Discarded=0.01 cfs 181 cf Tertiary=0.00 cfs 0 cf Outflow=0.01 cfs 181 cf
Link Dp1: Dp1	Inflow=2.67 cfs 7,474 cf Primary=2.67 cfs 7,474 cf
Link Dp2: Dp2	Inflow=0.02 cfs 46 cf Primary=0.02 cfs 46 cf
Link Dp3: Dp3	Inflow=0.30 cfs 641 cf Primary=0.30 cfs 641 cf

Total Runoff Area = 60,392 sf Runoff Volume = 8,343 cf Average Runoff Depth = 1.66"
35.51% Pervious = 21,443 sf 64.49% Impervious = 38,949 sf

Stage-Discharge for Pond 1P: DETENTION POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
495.75	0.00	0.00	0.00	0.00
495.85	0.03	0.03	0.00	0.00
495.95	0.12	0.12	0.00	0.00
496.05	0.26	0.26	0.00	0.00
496.15	0.42	0.42	0.00	0.00
496.25	0.59	0.59	0.00	0.00
496.35	0.71	0.71	0.00	0.00
496.45	0.82	0.82	0.00	0.00
496.55	0.92	0.92	0.00	0.00
496.65	1.00	1.00	0.00	0.00
496.75	1.08	1.08	0.00	0.00
496.85	1.16	1.16	0.00	0.00
496.95	1.23	1.23	0.00	0.00
497.05	1.29	1.29	0.00	0.00
497.15	1.35	1.35	0.00	0.00
497.25	1.41	1.41	0.00	0.00
497.35	1.47	1.47	0.00	0.00
497.45	1.53	1.53	0.00	0.00
497.55	1.91	1.91	0.00	0.00
497.65	2.55	2.55	0.00	0.00
497.75	3.37	3.37	0.00	0.00
497.85	3.78	3.78	0.00	0.00
497.95	3.89	3.89	0.00	0.00
498.05	4.01	4.01	0.00	0.00
498.15	4.12	4.12	0.00	0.00
498.25	4.22	4.22	0.00	0.00
498.35	4.33	4.33	0.00	0.00
498.45	4.43	4.43	0.00	0.00
498.55	4.85	4.53	0.32	0.00
498.65	5.53	4.63	0.91	0.00
498.75	6.41	4.72	1.69	0.00
498.85	7.46	4.81	2.64	0.00
498.95	8.60	4.91	3.69	0.00



Stage-Area-Storage for Pond 1P: DETENTION POND

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
495.75	0	498.40	1,555
495.80	7	498.45	1,614
495.85	16	498.50	1,674
495.90	24	498.55	1,736
495.95	34	498.60	1,799
496.00	45	498.65	1,863
496.05	56	498.70	1,929
496.10	68	498.75	1,996
496.15	81	498.80	2,050
496.20	94	498.85	2,104
496.25	109	498.90	2,160
496.30	124	498.95	2,216
496.35	140	499.00	2,272
496.40	156		
496.45	174		
496.50	192		
496.55	211		
496.60	231		
496.65	251		
496.70	272		
496.75	294		
496.80	317		
496.85	341		
496.90	365		
496.95	390		
497.00	416		
497.05	443		
497.10	471		
497.15	499		
497.20	528		
497.25	558		
497.30	588		
497.35	619		
497.40	652		
497.45	684		
497.50	718		
497.55	754		
497.60	791		
497.65	830		
497.70	870		
497.75	910		
497.80	953		
497.85	996		
497.90	1,040		
497.95	1,086		
498.00	1,132		
498.05	1,180		
498.10	1,230		
498.15	1,281		
498.20	1,333		
498.25	1,386		
498.30	1,441		
498.35	1,497		

Stage-Discharge for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)
504.25	0.00	0.00	0.00	505.31	0.01	0.01	0.00
504.27	0.01	0.01	0.00	505.33	0.01	0.01	0.00
504.29	0.01	0.01	0.00	505.35	0.01	0.01	0.00
504.31	0.01	0.01	0.00	505.37	0.01	0.01	0.00
504.33	0.01	0.01	0.00	505.39	0.01	0.01	0.00
504.35	0.01	0.01	0.00	505.41	0.01	0.01	0.00
504.37	0.01	0.01	0.00	505.43	0.01	0.01	0.00
504.39	0.01	0.01	0.00	505.45	0.01	0.01	0.00
504.41	0.01	0.01	0.00	505.47	0.01	0.01	0.00
504.43	0.01	0.01	0.00	505.49	0.01	0.01	0.00
504.45	0.01	0.01	0.00	505.51	0.01	0.01	0.00
504.47	0.01	0.01	0.00	505.53	0.01	0.01	0.00
504.49	0.01	0.01	0.00	505.55	0.01	0.01	0.00
504.51	0.01	0.01	0.00	505.57	0.01	0.01	0.00
504.53	0.01	0.01	0.00	505.59	0.01	0.01	0.00
504.55	0.01	0.01	0.00	505.61	0.01	0.01	0.00
504.57	0.01	0.01	0.00	505.63	0.01	0.01	0.00
504.59	0.01	0.01	0.00	505.65	0.01	0.01	0.00
504.61	0.01	0.01	0.00	505.67	0.01	0.01	0.00
504.63	0.01	0.01	0.00	505.69	0.01	0.01	0.00
504.65	0.01	0.01	0.00	505.71	0.01	0.01	0.00
504.67	0.01	0.01	0.00	505.73	0.01	0.01	0.00
504.69	0.01	0.01	0.00	505.75	0.01	0.01	0.00
504.71	0.01	0.01	0.00	505.77	0.01	0.01	0.00
504.73	0.01	0.01	0.00	505.79	0.01	0.01	0.00
504.75	0.01	0.01	0.00	505.81	0.01	0.01	0.00
504.77	0.01	0.01	0.00	505.83	0.01	0.01	0.00
504.79	0.01	0.01	0.00	505.85	0.01	0.01	0.00
504.81	0.01	0.01	0.00	505.87	0.01	0.01	0.00
504.83	0.01	0.01	0.00	505.89	0.01	0.01	0.00
504.85	0.01	0.01	0.00	505.91	0.12	0.01	0.11
504.87	0.01	0.01	0.00	505.93	0.59	0.01	0.58
504.89	0.01	0.01	0.00	505.95	1.25	0.01	1.25
504.91	0.01	0.01	0.00	505.97	2.07	0.01	2.07
504.93	0.01	0.01	0.00	505.99	3.02	0.01	3.01
504.95	0.01	0.01	0.00				
504.97	0.01	0.01	0.00				
504.99	0.01	0.01	0.00				
505.01	0.01	0.01	0.00				
505.03	0.01	0.01	0.00				
505.05	0.01	0.01	0.00				
505.07	0.01	0.01	0.00				
505.09	0.01	0.01	0.00				
505.11	0.01	0.01	0.00				
505.13	0.01	0.01	0.00				
505.15	0.01	0.01	0.00				
505.17	0.01	0.01	0.00				
505.19	0.01	0.01	0.00				
505.21	0.01	0.01	0.00				
505.23	0.01	0.01	0.00				
505.25	0.01	0.01	0.00				
505.27	0.01	0.01	0.00				
505.29	0.01	0.01	0.00				



Stage-Area-Storage for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
504.25	112	0	505.31	112	47
504.27	112	1	505.33	112	48
504.29	112	2	505.35	112	49
504.31	112	3	505.37	112	50
504.33	112	4	505.39	112	51
504.35	112	4	505.41	112	52
504.37	112	5	505.43	112	53
504.39	112	6	505.45	112	54
504.41	112	7	505.47	112	55
504.43	112	8	505.49	112	56
504.45	112	9	505.51	112	56
504.47	112	10	505.53	112	57
504.49	112	11	505.55	112	58
504.51	112	12	505.57	112	59
504.53	112	13	505.59	112	60
504.55	112	13	505.61	112	61
504.57	112	14	505.63	112	62
504.59	112	15	505.65	112	63
504.61	112	16	505.67	112	64
504.63	112	17	505.69	112	65
504.65	112	18	505.71	112	65
504.67	112	19	505.73	112	66
504.69	112	20	505.75	112	67
504.71	112	21	505.77	112	68
504.73	112	22	505.79	112	69
504.75	112	22	505.81	112	70
504.77	112	23	505.83	112	71
504.79	112	24	505.85	112	72
504.81	112	25	505.87	112	73
504.83	112	26	505.89	112	73
504.85	112	27	505.91	112	74
504.87	112	28	505.93	112	75
504.89	112	29	505.95	112	76
504.91	112	30	505.97	112	77
504.93	112	30	505.99	112	78
504.95	112	31			
504.97	112	32			
504.99	112	33			
505.01	112	34			
505.03	112	35			
505.05	112	36			
505.07	112	37			
505.09	112	38			
505.11	112	39			
505.13	112	39			
505.15	112	40			
505.17	112	41			
505.19	112	42			
505.21	112	43			
505.23	112	44			
505.25	112	45			
505.27	112	46			
505.29	112	47			

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Type II 24-hr 10-yr Rainfall=3.83"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1R: P-1R Runoff Area=907 sf 100.00% Impervious Runoff Depth=3.60"
Flow Length=21' Tc=6.0 min CN=98 Runoff=0.11 cfs 272 cf

Subcatchment P-1S: P-1S Runoff Area=48,907 sf 71.14% Impervious Runoff Depth=2.76"
Flow Length=356' Tc=6.0 min CN=90 Runoff=5.10 cfs 11,242 cf

Subcatchment P-2S: P-2S Runoff Area=997 sf 0.00% Impervious Runoff Depth=1.28"
Flow Length=124' Tc=6.0 min CN=71 Runoff=0.05 cfs 106 cf

Subcatchment P-3S: P-3S Runoff Area=5,414 sf 59.99% Impervious Runoff Depth=2.48"
Flow Length=83' Tc=6.0 min CN=87 Runoff=0.52 cfs 1,119 cf

Subcatchment P-PP 01: Pervious Patio 1 Runoff Area=214 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 60 cf

Subcatchment P-PP 02: Pervious Patio 2 Runoff Area=582 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 164 cf

Subcatchment P-PP 03: Pervious Walkway Runoff Area=663 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 186 cf

Subcatchment P-PP 04: Pervious Walkway Runoff Area=2,708 sf 0.00% Impervious Runoff Depth>3.37"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.02 cfs 761 cf

Pond 1P: DETENTION POND Peak Elev=498.11' Storage=1,245 cf Inflow=5.10 cfs 11,242 cf
Primary=4.08 cfs 11,242 cf Secondary=0.00 cfs 0 cf Tertiary=0.00 cfs 0 cf Outflow=4.08 cfs 11,242 cf

Pond DRIP 01: DRIP EDGE 01 Peak Elev=505.91' Storage=74 cf Inflow=0.11 cfs 272 cf
Discarded=0.01 cfs 229 cf Tertiary=0.14 cfs 71 cf Outflow=0.15 cfs 299 cf

Link Dp1: Dp1 Inflow=4.22 cfs 12,483 cf
Primary=4.22 cfs 12,483 cf

Link Dp2: Dp2 Inflow=0.05 cfs 106 cf
Primary=0.05 cfs 106 cf

Link Dp3: Dp3 Inflow=0.52 cfs 1,119 cf
Primary=0.52 cfs 1,119 cf

Total Runoff Area = 60,392 sf Runoff Volume = 13,910 cf Average Runoff Depth = 2.76"
35.51% Pervious = 21,443 sf 64.49% Impervious = 38,949 sf



Stage-Discharge for Pond 1P: DETENTION POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
495.75	0.00	0.00	0.00	0.00
495.85	0.03	0.03	0.00	0.00
495.95	0.12	0.12	0.00	0.00
496.05	0.26	0.26	0.00	0.00
496.15	0.42	0.42	0.00	0.00
496.25	0.59	0.59	0.00	0.00
496.35	0.71	0.71	0.00	0.00
496.45	0.82	0.82	0.00	0.00
496.55	0.92	0.92	0.00	0.00
496.65	1.00	1.00	0.00	0.00
496.75	1.08	1.08	0.00	0.00
496.85	1.16	1.16	0.00	0.00
496.95	1.23	1.23	0.00	0.00
497.05	1.29	1.29	0.00	0.00
497.15	1.35	1.35	0.00	0.00
497.25	1.41	1.41	0.00	0.00
497.35	1.47	1.47	0.00	0.00
497.45	1.53	1.53	0.00	0.00
497.55	1.91	1.91	0.00	0.00
497.65	2.55	2.55	0.00	0.00
497.75	3.37	3.37	0.00	0.00
497.85	3.78	3.78	0.00	0.00
497.95	3.89	3.89	0.00	0.00
498.05	4.01	4.01	0.00	0.00
498.15	4.12	4.12	0.00	0.00
498.25	4.22	4.22	0.00	0.00
498.35	4.33	4.33	0.00	0.00
498.45	4.43	4.43	0.00	0.00
498.55	4.85	4.53	0.32	0.00
498.65	5.53	4.63	0.91	0.00
498.75	6.41	4.72	1.69	0.00
498.85	7.46	4.81	2.64	0.00
498.95	8.60	4.91	3.69	0.00

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Type II 24-hr 10-yr Rainfall=3.83"

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Stage-Area-Storage for Pond 1P: DETENTION POND

<u>Elevation (feet)</u>	<u>Storage (cubic-feet)</u>	<u>Elevation (feet)</u>	<u>Storage (cubic-feet)</u>
495.75	0	498.40	1,555
495.80	7	498.45	1,614
495.85	16	498.50	1,674
495.90	24	498.55	1,736
495.95	34	498.60	1,799
496.00	45	498.65	1,863
496.05	56	498.70	1,929
496.10	68	498.75	1,996
496.15	81	498.80	2,050
496.20	94	498.85	2,104
496.25	109	498.90	2,160
496.30	124	498.95	2,216
496.35	140	499.00	2,272
496.40	156		
496.45	174		
496.50	192		
496.55	211		
496.60	231		
496.65	251		
496.70	272		
496.75	294		
496.80	317		
496.85	341		
496.90	365		
496.95	390		
497.00	416		
497.05	443		
497.10	471		
497.15	499		
497.20	528		
497.25	558		
497.30	588		
497.35	619		
497.40	652		
497.45	684		
497.50	718		
497.55	754		
497.60	791		
497.65	830		
497.70	870		
497.75	910		
497.80	953		
497.85	996		
497.90	1,040		
497.95	1,086		
498.00	1,132		
498.05	1,180		
498.10	1,230		
498.15	1,281		
498.20	1,333		
498.25	1,386		
498.30	1,441		
498.35	1,497		



Stage-Discharge for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)
504.25	0.00	0.00	0.00	505.31	0.01	0.01	0.00
504.27	0.01	0.01	0.00	505.33	0.01	0.01	0.00
504.29	0.01	0.01	0.00	505.35	0.01	0.01	0.00
504.31	0.01	0.01	0.00	505.37	0.01	0.01	0.00
504.33	0.01	0.01	0.00	505.39	0.01	0.01	0.00
504.35	0.01	0.01	0.00	505.41	0.01	0.01	0.00
504.37	0.01	0.01	0.00	505.43	0.01	0.01	0.00
504.39	0.01	0.01	0.00	505.45	0.01	0.01	0.00
504.41	0.01	0.01	0.00	505.47	0.01	0.01	0.00
504.43	0.01	0.01	0.00	505.49	0.01	0.01	0.00
504.45	0.01	0.01	0.00	505.51	0.01	0.01	0.00
504.47	0.01	0.01	0.00	505.53	0.01	0.01	0.00
504.49	0.01	0.01	0.00	505.55	0.01	0.01	0.00
504.51	0.01	0.01	0.00	505.57	0.01	0.01	0.00
504.53	0.01	0.01	0.00	505.59	0.01	0.01	0.00
504.55	0.01	0.01	0.00	505.61	0.01	0.01	0.00
504.57	0.01	0.01	0.00	505.63	0.01	0.01	0.00
504.59	0.01	0.01	0.00	505.65	0.01	0.01	0.00
504.61	0.01	0.01	0.00	505.67	0.01	0.01	0.00
504.63	0.01	0.01	0.00	505.69	0.01	0.01	0.00
504.65	0.01	0.01	0.00	505.71	0.01	0.01	0.00
504.67	0.01	0.01	0.00	505.73	0.01	0.01	0.00
504.69	0.01	0.01	0.00	505.75	0.01	0.01	0.00
504.71	0.01	0.01	0.00	505.77	0.01	0.01	0.00
504.73	0.01	0.01	0.00	505.79	0.01	0.01	0.00
504.75	0.01	0.01	0.00	505.81	0.01	0.01	0.00
504.77	0.01	0.01	0.00	505.83	0.01	0.01	0.00
504.79	0.01	0.01	0.00	505.85	0.01	0.01	0.00
504.81	0.01	0.01	0.00	505.87	0.01	0.01	0.00
504.83	0.01	0.01	0.00	505.89	0.01	0.01	0.00
504.85	0.01	0.01	0.00	505.91	0.12	0.01	0.11
504.87	0.01	0.01	0.00	505.93	0.59	0.01	0.58
504.89	0.01	0.01	0.00	505.95	1.25	0.01	1.25
504.91	0.01	0.01	0.00	505.97	2.07	0.01	2.07
504.93	0.01	0.01	0.00	505.99	3.02	0.01	3.01
504.95	0.01	0.01	0.00				
504.97	0.01	0.01	0.00				
504.99	0.01	0.01	0.00				
505.01	0.01	0.01	0.00				
505.03	0.01	0.01	0.00				
505.05	0.01	0.01	0.00				
505.07	0.01	0.01	0.00				
505.09	0.01	0.01	0.00				
505.11	0.01	0.01	0.00				
505.13	0.01	0.01	0.00				
505.15	0.01	0.01	0.00				
505.17	0.01	0.01	0.00				
505.19	0.01	0.01	0.00				
505.21	0.01	0.01	0.00				
505.23	0.01	0.01	0.00				
505.25	0.01	0.01	0.00				
505.27	0.01	0.01	0.00				
505.29	0.01	0.01	0.00				

Stage-Area-Storage for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
504.25	112	0	505.31	112	47
504.27	112	1	505.33	112	48
504.29	112	2	505.35	112	49
504.31	112	3	505.37	112	50
504.33	112	4	505.39	112	51
504.35	112	4	505.41	112	52
504.37	112	5	505.43	112	53
504.39	112	6	505.45	112	54
504.41	112	7	505.47	112	55
504.43	112	8	505.49	112	56
504.45	112	9	505.51	112	56
504.47	112	10	505.53	112	57
504.49	112	11	505.55	112	58
504.51	112	12	505.57	112	59
504.53	112	13	505.59	112	60
504.55	112	13	505.61	112	61
504.57	112	14	505.63	112	62
504.59	112	15	505.65	112	63
504.61	112	16	505.67	112	64
504.63	112	17	505.69	112	65
504.65	112	18	505.71	112	65
504.67	112	19	505.73	112	66
504.69	112	20	505.75	112	67
504.71	112	21	505.77	112	68
504.73	112	22	505.79	112	69
504.75	112	22	505.81	112	70
504.77	112	23	505.83	112	71
504.79	112	24	505.85	112	72
504.81	112	25	505.87	112	73
504.83	112	26	505.89	112	73
504.85	112	27	505.91	112	74
504.87	112	28	505.93	112	75
504.89	112	29	505.95	112	76
504.91	112	30	505.97	112	77
504.93	112	30	505.99	112	78
504.95	112	31			
504.97	112	32			
504.99	112	33			
505.01	112	34			
505.03	112	35			
505.05	112	36			
505.07	112	37			
505.09	112	38			
505.11	112	39			
505.13	112	39			
505.15	112	40			
505.17	112	41			
505.19	112	42			
505.21	112	43			
505.23	112	44			
505.25	112	45			
505.27	112	46			
505.29	112	47			



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Type II 24-hr 50-yr Rainfall=5.58"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P-1R: P-1R Runoff Area=907 sf 100.00% Impervious Runoff Depth=5.34"
 Flow Length=21' Tc=6.0 min CN=98 Runoff=0.16 cfs 404 cf

Subcatchment P-1S: P-1S Runoff Area=48,907 sf 71.14% Impervious Runoff Depth=4.44"
 Flow Length=356' Tc=6.0 min CN=90 Runoff=7.98 cfs 18,085 cf

Subcatchment P-2S: P-2S Runoff Area=997 sf 0.00% Impervious Runoff Depth=2.56"
 Flow Length=124' Tc=6.0 min CN=71 Runoff=0.10 cfs 213 cf

Subcatchment P-3S: P-3S Runoff Area=5,414 sf 59.99% Impervious Runoff Depth=4.12"
 Flow Length=83' Tc=6.0 min CN=87 Runoff=0.84 cfs 1,857 cf

Subcatchment P-PP 01: Pervious Patio 1 Runoff Area=214 sf 0.00% Impervious Runoff Depth>5.11"
 Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 91 cf

Subcatchment P-PP 02: Pervious Patio 2 Runoff Area=582 sf 0.00% Impervious Runoff Depth>5.11"
 Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 248 cf

Subcatchment P-PP 03: Pervious Walkway Runoff Area=663 sf 0.00% Impervious Runoff Depth>5.11"
 Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 282 cf

Subcatchment P-PP 04: Pervious Walkway Runoff Area=2,708 sf 0.00% Impervious Runoff Depth>5.11"
 Flow Length=1' Tc=520.0 min CN=96 Runoff=0.03 cfs 1,153 cf

Pond 1P: DETENTION POND Peak Elev=498.81' Storage=2,059 cf Inflow=7.98 cfs 18,085 cf
 Primary=4.78 cfs 17,400 cf Secondary=2.17 cfs 685 cf Tertiary=0.00 cfs 0 cf Outflow=6.95 cfs 18,085 cf

Pond DRIP 01: DRIP EDGE 01 Peak Elev=505.91' Storage=74 cf Inflow=0.16 cfs 404 cf
 Discarded=0.01 cfs 283 cf Tertiary=0.12 cfs 96 cf Outflow=0.13 cfs 380 cf

Link Dp1: Dp1 Inflow=7.06 cfs 19,956 cf
 Primary=7.06 cfs 19,956 cf

Link Dp2: Dp2 Inflow=0.10 cfs 213 cf
 Primary=0.10 cfs 213 cf

Link Dp3: Dp3 Inflow=0.84 cfs 1,857 cf
 Primary=0.84 cfs 1,857 cf

Total Runoff Area = 60,392 sf Runoff Volume = 22,334 cf Average Runoff Depth = 4.44"
35.51% Pervious = 21,443 sf 64.49% Impervious = 38,949 sf

Stage-Discharge for Pond 1P: DETENTION POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
495.75	0.00	0.00	0.00	0.00
495.85	0.03	0.03	0.00	0.00
495.95	0.12	0.12	0.00	0.00
496.05	0.26	0.26	0.00	0.00
496.15	0.42	0.42	0.00	0.00
496.25	0.59	0.59	0.00	0.00
496.35	0.71	0.71	0.00	0.00
496.45	0.82	0.82	0.00	0.00
496.55	0.92	0.92	0.00	0.00
496.65	1.00	1.00	0.00	0.00
496.75	1.08	1.08	0.00	0.00
496.85	1.16	1.16	0.00	0.00
496.95	1.23	1.23	0.00	0.00
497.05	1.29	1.29	0.00	0.00
497.15	1.35	1.35	0.00	0.00
497.25	1.41	1.41	0.00	0.00
497.35	1.47	1.47	0.00	0.00
497.45	1.53	1.53	0.00	0.00
497.55	1.91	1.91	0.00	0.00
497.65	2.55	2.55	0.00	0.00
497.75	3.37	3.37	0.00	0.00
497.85	3.78	3.78	0.00	0.00
497.95	3.89	3.89	0.00	0.00
498.05	4.01	4.01	0.00	0.00
498.15	4.12	4.12	0.00	0.00
498.25	4.22	4.22	0.00	0.00
498.35	4.33	4.33	0.00	0.00
498.45	4.43	4.43	0.00	0.00
498.55	4.85	4.53	0.32	0.00
498.65	5.53	4.63	0.91	0.00
498.75	6.41	4.72	1.69	0.00
498.85	7.46	4.81	2.64	0.00
498.95	8.60	4.91	3.69	0.00



Stage-Area-Storage for Pond 1P: DETENTION POND

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
495.75	0	498.40	1,555
495.80	7	498.45	1,614
495.85	16	498.50	1,674
495.90	24	498.55	1,736
495.95	34	498.60	1,799
496.00	45	498.65	1,863
496.05	56	498.70	1,929
496.10	68	498.75	1,996
496.15	81	498.80	2,050
496.20	94	498.85	2,104
496.25	109	498.90	2,160
496.30	124	498.95	2,216
496.35	140	499.00	2,272
496.40	156		
496.45	174		
496.50	192		
496.55	211		
496.60	231		
496.65	251		
496.70	272		
496.75	294		
496.80	317		
496.85	341		
496.90	365		
496.95	390		
497.00	416		
497.05	443		
497.10	471		
497.15	499		
497.20	528		
497.25	558		
497.30	588		
497.35	619		
497.40	652		
497.45	684		
497.50	718		
497.55	754		
497.60	791		
497.65	830		
497.70	870		
497.75	910		
497.80	953		
497.85	996		
497.90	1,040		
497.95	1,086		
498.00	1,132		
498.05	1,180		
498.10	1,230		
498.15	1,281		
498.20	1,333		
498.25	1,386		
498.30	1,441		
498.35	1,497		

Stage-Discharge for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)
504.25	0.00	0.00	0.00	505.31	0.01	0.01	0.00
504.27	0.01	0.01	0.00	505.33	0.01	0.01	0.00
504.29	0.01	0.01	0.00	505.35	0.01	0.01	0.00
504.31	0.01	0.01	0.00	505.37	0.01	0.01	0.00
504.33	0.01	0.01	0.00	505.39	0.01	0.01	0.00
504.35	0.01	0.01	0.00	505.41	0.01	0.01	0.00
504.37	0.01	0.01	0.00	505.43	0.01	0.01	0.00
504.39	0.01	0.01	0.00	505.45	0.01	0.01	0.00
504.41	0.01	0.01	0.00	505.47	0.01	0.01	0.00
504.43	0.01	0.01	0.00	505.49	0.01	0.01	0.00
504.45	0.01	0.01	0.00	505.51	0.01	0.01	0.00
504.47	0.01	0.01	0.00	505.53	0.01	0.01	0.00
504.49	0.01	0.01	0.00	505.55	0.01	0.01	0.00
504.51	0.01	0.01	0.00	505.57	0.01	0.01	0.00
504.53	0.01	0.01	0.00	505.59	0.01	0.01	0.00
504.55	0.01	0.01	0.00	505.61	0.01	0.01	0.00
504.57	0.01	0.01	0.00	505.63	0.01	0.01	0.00
504.59	0.01	0.01	0.00	505.65	0.01	0.01	0.00
504.61	0.01	0.01	0.00	505.67	0.01	0.01	0.00
504.63	0.01	0.01	0.00	505.69	0.01	0.01	0.00
504.65	0.01	0.01	0.00	505.71	0.01	0.01	0.00
504.67	0.01	0.01	0.00	505.73	0.01	0.01	0.00
504.69	0.01	0.01	0.00	505.75	0.01	0.01	0.00
504.71	0.01	0.01	0.00	505.77	0.01	0.01	0.00
504.73	0.01	0.01	0.00	505.79	0.01	0.01	0.00
504.75	0.01	0.01	0.00	505.81	0.01	0.01	0.00
504.77	0.01	0.01	0.00	505.83	0.01	0.01	0.00
504.79	0.01	0.01	0.00	505.85	0.01	0.01	0.00
504.81	0.01	0.01	0.00	505.87	0.01	0.01	0.00
504.83	0.01	0.01	0.00	505.89	0.01	0.01	0.00
504.85	0.01	0.01	0.00	505.91	0.12	0.01	0.11
504.87	0.01	0.01	0.00	505.93	0.59	0.01	0.58
504.89	0.01	0.01	0.00	505.95	1.25	0.01	1.25
504.91	0.01	0.01	0.00	505.97	2.07	0.01	2.07
504.93	0.01	0.01	0.00	505.99	3.02	0.01	3.01
504.95	0.01	0.01	0.00				
504.97	0.01	0.01	0.00				
504.99	0.01	0.01	0.00				
505.01	0.01	0.01	0.00				
505.03	0.01	0.01	0.00				
505.05	0.01	0.01	0.00				
505.07	0.01	0.01	0.00				
505.09	0.01	0.01	0.00				
505.11	0.01	0.01	0.00				
505.13	0.01	0.01	0.00				
505.15	0.01	0.01	0.00				
505.17	0.01	0.01	0.00				
505.19	0.01	0.01	0.00				
505.21	0.01	0.01	0.00				
505.23	0.01	0.01	0.00				
505.25	0.01	0.01	0.00				
505.27	0.01	0.01	0.00				
505.29	0.01	0.01	0.00				



Stage-Area-Storage for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
504.25	112	0	505.31	112	47
504.27	112	1	505.33	112	48
504.29	112	2	505.35	112	49
504.31	112	3	505.37	112	50
504.33	112	4	505.39	112	51
504.35	112	4	505.41	112	52
504.37	112	5	505.43	112	53
504.39	112	6	505.45	112	54
504.41	112	7	505.47	112	55
504.43	112	8	505.49	112	56
504.45	112	9	505.51	112	56
504.47	112	10	505.53	112	57
504.49	112	11	505.55	112	58
504.51	112	12	505.57	112	59
504.53	112	13	505.59	112	60
504.55	112	13	505.61	112	61
504.57	112	14	505.63	112	62
504.59	112	15	505.65	112	63
504.61	112	16	505.67	112	64
504.63	112	17	505.69	112	65
504.65	112	18	505.71	112	65
504.67	112	19	505.73	112	66
504.69	112	20	505.75	112	67
504.71	112	21	505.77	112	68
504.73	112	22	505.79	112	69
504.75	112	22	505.81	112	70
504.77	112	23	505.83	112	71
504.79	112	24	505.85	112	72
504.81	112	25	505.87	112	73
504.83	112	26	505.89	112	73
504.85	112	27	505.91	112	74
504.87	112	28	505.93	112	75
504.89	112	29	505.95	112	76
504.91	112	30	505.97	112	77
504.93	112	30	505.99	112	78
504.95	112	31			
504.97	112	32			
504.99	112	33			
505.01	112	34			
505.03	112	35			
505.05	112	36			
505.07	112	37			
505.09	112	38			
505.11	112	39			
505.13	112	39			
505.15	112	40			
505.17	112	41			
505.19	112	42			
505.21	112	43			
505.23	112	44			
505.25	112	45			
505.27	112	46			
505.29	112	47			

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Type II 24-hr 100-yr Rainfall=6.57"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentP-1R: P-1R Runoff Area=907 sf 100.00% Impervious Runoff Depth=6.33"
Flow Length=21' Tc=6.0 min CN=98 Runoff=0.19 cfs 479 cf

SubcatchmentP-1S: P-1S Runoff Area=48,907 sf 71.14% Impervious Runoff Depth=5.40"
Flow Length=356' Tc=6.0 min CN=90 Runoff=9.59 cfs 22,017 cf

SubcatchmentP-2S: P-2S Runoff Area=997 sf 0.00% Impervious Runoff Depth=3.36"
Flow Length=124' Tc=6.0 min CN=71 Runoff=0.13 cfs 280 cf

SubcatchmentP-3S: P-3S Runoff Area=5,414 sf 59.99% Impervious Runoff Depth=5.06"
Flow Length=83' Tc=6.0 min CN=87 Runoff=1.02 cfs 2,285 cf

SubcatchmentP-PP 01: Pervious Patio 1 Runoff Area=214 sf 0.00% Impervious Runoff Depth>6.09"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.00 cfs 109 cf

SubcatchmentP-PP 02: Pervious Patio 2 Runoff Area=582 sf 0.00% Impervious Runoff Depth>6.09"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 296 cf

SubcatchmentP-PP 03: Pervious Walkway Runoff Area=663 sf 0.00% Impervious Runoff Depth>6.09"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.01 cfs 337 cf

SubcatchmentP-PP 04: Pervious Walkway Runoff Area=2,708 sf 0.00% Impervious Runoff Depth>6.09"
Flow Length=1' Tc=520.0 min CN=96 Runoff=0.04 cfs 1,375 cf

Pond 1P: DETENTION POND Peak Elev=498.99' Storage=2,264 cf Inflow=9.59 cfs 22,017 cf
Primary=4.94 cfs 20,356 cf Secondary=4.18 cfs 1,661 cf Tertiary=0.00 cfs 0 cf Outflow=9.12 cfs 22,017 cf

Pond DRIP 01: DRIP EDGE 01 Peak Elev=505.91' Storage=74 cf Inflow=0.19 cfs 479 cf
Discarded=0.01 cfs 311 cf Tertiary=0.13 cfs 107 cf Outflow=0.14 cfs 417 cf

Link Dp1: Dp1 Inflow=9.25 cfs 24,240 cf
Primary=9.25 cfs 24,240 cf

Link Dp2: Dp2 Inflow=0.13 cfs 280 cf
Primary=0.13 cfs 280 cf

Link Dp3: Dp3 Inflow=1.02 cfs 2,285 cf
Primary=1.02 cfs 2,285 cf

Total Runoff Area = 60,392 sf Runoff Volume = 27,176 cf Average Runoff Depth = 5.40"
35.51% Pervious = 21,443 sf 64.49% Impervious = 38,949 sf



Stage-Discharge for Pond 1P: DETENTION POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
495.75	0.00	0.00	0.00	0.00
495.85	0.03	0.03	0.00	0.00
495.95	0.12	0.12	0.00	0.00
496.05	0.26	0.26	0.00	0.00
496.15	0.42	0.42	0.00	0.00
496.25	0.59	0.59	0.00	0.00
496.35	0.71	0.71	0.00	0.00
496.45	0.82	0.82	0.00	0.00
496.55	0.92	0.92	0.00	0.00
496.65	1.00	1.00	0.00	0.00
496.75	1.08	1.08	0.00	0.00
496.85	1.16	1.16	0.00	0.00
496.95	1.23	1.23	0.00	0.00
497.05	1.29	1.29	0.00	0.00
497.15	1.35	1.35	0.00	0.00
497.25	1.41	1.41	0.00	0.00
497.35	1.47	1.47	0.00	0.00
497.45	1.53	1.53	0.00	0.00
497.55	1.91	1.91	0.00	0.00
497.65	2.55	2.55	0.00	0.00
497.75	3.37	3.37	0.00	0.00
497.85	3.78	3.78	0.00	0.00
497.95	3.89	3.89	0.00	0.00
498.05	4.01	4.01	0.00	0.00
498.15	4.12	4.12	0.00	0.00
498.25	4.22	4.22	0.00	0.00
498.35	4.33	4.33	0.00	0.00
498.45	4.43	4.43	0.00	0.00
498.55	4.85	4.53	0.32	0.00
498.65	5.53	4.63	0.91	0.00
498.75	6.41	4.72	1.69	0.00
498.85	7.46	4.81	2.64	0.00
498.95	8.60	4.91	3.69	0.00

Stage-Area-Storage for Pond 1P: DETENTION POND

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
495.75	0	498.40	1,555
495.80	7	498.45	1,614
495.85	16	498.50	1,674
495.90	24	498.55	1,736
495.95	34	498.60	1,799
496.00	45	498.65	1,863
496.05	56	498.70	1,929
496.10	68	498.75	1,996
496.15	81	498.80	2,050
496.20	94	498.85	2,104
496.25	109	498.90	2,160
496.30	124	498.95	2,216
496.35	140	499.00	2,272
496.40	156		
496.45	174		
496.50	192		
496.55	211		
496.60	231		
496.65	251		
496.70	272		
496.75	294		
496.80	317		
496.85	341		
496.90	365		
496.95	390		
497.00	416		
497.05	443		
497.10	471		
497.15	499		
497.20	528		
497.25	558		
497.30	588		
497.35	619		
497.40	652		
497.45	684		
497.50	718		
497.55	754		
497.60	791		
497.65	830		
497.70	870		
497.75	910		
497.80	953		
497.85	996		
497.90	1,040		
497.95	1,086		
498.00	1,132		
498.05	1,180		
498.10	1,230		
498.15	1,281		
498.20	1,333		
498.25	1,386		
498.30	1,441		
498.35	1,497		



Stage-Discharge for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)
504.25	0.00	0.00	0.00	505.31	0.01	0.01	0.00
504.27	0.01	0.01	0.00	505.33	0.01	0.01	0.00
504.29	0.01	0.01	0.00	505.35	0.01	0.01	0.00
504.31	0.01	0.01	0.00	505.37	0.01	0.01	0.00
504.33	0.01	0.01	0.00	505.39	0.01	0.01	0.00
504.35	0.01	0.01	0.00	505.41	0.01	0.01	0.00
504.37	0.01	0.01	0.00	505.43	0.01	0.01	0.00
504.39	0.01	0.01	0.00	505.45	0.01	0.01	0.00
504.41	0.01	0.01	0.00	505.47	0.01	0.01	0.00
504.43	0.01	0.01	0.00	505.49	0.01	0.01	0.00
504.45	0.01	0.01	0.00	505.51	0.01	0.01	0.00
504.47	0.01	0.01	0.00	505.53	0.01	0.01	0.00
504.49	0.01	0.01	0.00	505.55	0.01	0.01	0.00
504.51	0.01	0.01	0.00	505.57	0.01	0.01	0.00
504.53	0.01	0.01	0.00	505.59	0.01	0.01	0.00
504.55	0.01	0.01	0.00	505.61	0.01	0.01	0.00
504.57	0.01	0.01	0.00	505.63	0.01	0.01	0.00
504.59	0.01	0.01	0.00	505.65	0.01	0.01	0.00
504.61	0.01	0.01	0.00	505.67	0.01	0.01	0.00
504.63	0.01	0.01	0.00	505.69	0.01	0.01	0.00
504.65	0.01	0.01	0.00	505.71	0.01	0.01	0.00
504.67	0.01	0.01	0.00	505.73	0.01	0.01	0.00
504.69	0.01	0.01	0.00	505.75	0.01	0.01	0.00
504.71	0.01	0.01	0.00	505.77	0.01	0.01	0.00
504.73	0.01	0.01	0.00	505.79	0.01	0.01	0.00
504.75	0.01	0.01	0.00	505.81	0.01	0.01	0.00
504.77	0.01	0.01	0.00	505.83	0.01	0.01	0.00
504.79	0.01	0.01	0.00	505.85	0.01	0.01	0.00
504.81	0.01	0.01	0.00	505.87	0.01	0.01	0.00
504.83	0.01	0.01	0.00	505.89	0.01	0.01	0.00
504.85	0.01	0.01	0.00	505.91	0.12	0.01	0.11
504.87	0.01	0.01	0.00	505.93	0.59	0.01	0.58
504.89	0.01	0.01	0.00	505.95	1.25	0.01	1.25
504.91	0.01	0.01	0.00	505.97	2.07	0.01	2.07
504.93	0.01	0.01	0.00	505.99	3.02	0.01	3.01
504.95	0.01	0.01	0.00				
504.97	0.01	0.01	0.00				
504.99	0.01	0.01	0.00				
505.01	0.01	0.01	0.00				
505.03	0.01	0.01	0.00				
505.05	0.01	0.01	0.00				
505.07	0.01	0.01	0.00				
505.09	0.01	0.01	0.00				
505.11	0.01	0.01	0.00				
505.13	0.01	0.01	0.00				
505.15	0.01	0.01	0.00				
505.17	0.01	0.01	0.00				
505.19	0.01	0.01	0.00				
505.21	0.01	0.01	0.00				
505.23	0.01	0.01	0.00				
505.25	0.01	0.01	0.00				
505.27	0.01	0.01	0.00				
505.29	0.01	0.01	0.00				

Stage-Area-Storage for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
504.25	112	0	505.31	112	47
504.27	112	1	505.33	112	48
504.29	112	2	505.35	112	49
504.31	112	3	505.37	112	50
504.33	112	4	505.39	112	51
504.35	112	4	505.41	112	52
504.37	112	5	505.43	112	53
504.39	112	6	505.45	112	54
504.41	112	7	505.47	112	55
504.43	112	8	505.49	112	56
504.45	112	9	505.51	112	56
504.47	112	10	505.53	112	57
504.49	112	11	505.55	112	58
504.51	112	12	505.57	112	59
504.53	112	13	505.59	112	60
504.55	112	13	505.61	112	61
504.57	112	14	505.63	112	62
504.59	112	15	505.65	112	63
504.61	112	16	505.67	112	64
504.63	112	17	505.69	112	65
504.65	112	18	505.71	112	65
504.67	112	19	505.73	112	66
504.69	112	20	505.75	112	67
504.71	112	21	505.77	112	68
504.73	112	22	505.79	112	69
504.75	112	22	505.81	112	70
504.77	112	23	505.83	112	71
504.79	112	24	505.85	112	72
504.81	112	25	505.87	112	73
504.83	112	26	505.89	112	73
504.85	112	27	505.91	112	74
504.87	112	28	505.93	112	75
504.89	112	29	505.95	112	76
504.91	112	30	505.97	112	77
504.93	112	30	505.99	112	78
504.95	112	31			
504.97	112	32			
504.99	112	33			
505.01	112	34			
505.03	112	35			
505.05	112	36			
505.07	112	37			
505.09	112	38			
505.11	112	39			
505.13	112	39			
505.15	112	40			
505.17	112	41			
505.19	112	42			
505.21	112	43			
505.23	112	44			
505.25	112	45			
505.27	112	46			
505.29	112	47			



**2.2.2 Post-Development Full Summary Diagram
10 - Year Storm Event**

Summary for Subcatchment P-1R: P-1R

Runoff = 0.11 cfs @ 11.96 hrs, Volume= 272 cf, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	815	98	New Building Roof, HSG C
*	92	98	Drip Edge, HSG C
	907	98	Weighted Average
	907		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	21		0.06		Direct Entry, TR-55 MIN



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Type II 24-hr 10-yr Rainfall=3.83"

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Summary for Subcatchment P-1S: P-1S

Runoff = 5.10 cfs @ 11.97 hrs, Volume= 11,242 cf, Depth= 2.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	15,498	98	Prop. Bluestone parking, HSG C
*	430	98	Sidewalks & walkways, HSG C
*	0	98	Paver patio, HSG C
*	10,957	98	Buildings, HSG C
*	6,842	98	Ex. pavement, HSG C
*	0	98	Paved aprons, HSG C
	237	70	Woods, Good, HSG C
	13,876	71	Meadow, non-grazed, HSG C
	1,067	98	Water Surface, HSG C
	48,907	90	Weighted Average
	14,113		28.86% Pervious Area
	34,794		71.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	356		0.99		Direct Entry, TR-55 MIN

Summary for Subcatchment P-2S: P-2S

Runoff = 0.05 cfs @ 11.98 hrs, Volume= 106 cf, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.83"

Area (sf)	CN	Description
318	70	Woods, Good, HSG C
30	65	Brush, Good, HSG C
649	71	Meadow, non-grazed, HSG C
997	71	Weighted Average
997		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	124		0.34		Direct Entry, Direct - TR-55



Summary for Subcatchment P-3S: P-3S

Runoff = 0.52 cfs @ 11.97 hrs, Volume= 1,119 cf, Depth= 2.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	2,774	98	Prop. Bluestone parking, HSG C
*	474	98	Paved parking apron, HSG C
	408	65	Brush, Good, HSG C
	1,758	71	Meadow, non-grazed, HSG C
	5,414	87	Weighted Average
	2,166		40.01% Pervious Area
	3,248		59.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	83		0.23		Direct Entry, TR-55

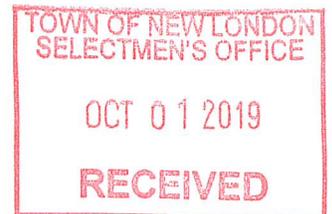
Summary for Subcatchment P-PP 01: Pervious Patio 1

Runoff = 0.00 cfs @ 18.52 hrs, Volume= 60 cf, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.83"

Area (sf)	CN	Description
* 214	96	Pervious Pavers, HSG C
214		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
520.0	1		0.00		Direct Entry, TR-55 MIN



Summary for Subcatchment P-PP 02: Pervious Patio 2

Runoff = 0.00 cfs @ 18.52 hrs, Volume= 164 cf, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	582	96	Pervious Pavers, HSG C
	582		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
520.0	1		0.00		Direct Entry, TR-55 MIN

Summary for Subcatchment P-PP 03: Pervious Walkway Upper

Runoff = 0.01 cfs @ 18.52 hrs, Volume= 186 cf, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.83"

Area (sf)	CN	Description
*	663	96 Pervious Pavers, HSG C
663		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
520.0	1		0.00		Direct Entry, TR-55 MIN



Summary for Subcatchment P-PP 04: Pervious Walkway Lower

Runoff = 0.02 cfs @ 18.52 hrs, Volume= 761 cf, Depth> 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-yr Rainfall=3.83"

	Area (sf)	CN	Description
*	2,708	96	Pervious Pavers, HSG C
	2,708		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
520.0	1		0.00		Direct Entry, TR-55 MIN

Summary for Pond 1P: DETENTION POND

Inflow Area = 48,907 sf, 71.14% Impervious, Inflow Depth = 2.76" for 10-yr event
 Inflow = 5.10 cfs @ 11.97 hrs, Volume= 11,242 cf
 Outflow = 4.08 cfs @ 12.02 hrs, Volume= 11,242 cf, Atten= 20%, Lag= 3.2 min
 Primary = 4.08 cfs @ 12.02 hrs, Volume= 11,242 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Tertiary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 498.11' @ 12.02 hrs Surf.Area= 1,010 sf Storage= 1,245 cf

Plug-Flow detention time= 5.0 min calculated for 11,230 cf (100% of inflow)
 Center-of-Mass det. time= 5.0 min (802.0 - 797.0)

Volume	Invert	Avail.Storage	Storage Description
#1	495.75'	2,087 cf	POND (Prismatic) Listed below (Recalc)
#2	497.50'	80 cf	SED. FOREBAY (Prismatic) Listed below (Recalc)
#3	497.50'	106 cf	SED. FOREBAY #2 (Prismatic) Listed below (Recalc)
		2,272 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
495.75	140	0	0
499.00	1,144	2,087	2,087

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
497.50	11	0	0
498.00	47	15	15
498.75	127	65	80

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
497.50	19	0	0
498.00	65	21	21
498.75	162	85	106

Device	Routing	Invert	Outlet Devices
#1	Primary	495.75'	12.0" Round Culvert L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 495.75' / 495.50' S= 0.0250 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	495.75'	7.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	497.45'	12.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	498.45'	4.0' long x 2.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32



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#5	Tertiary	499.00'	10.0' long x 2.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88
			2.85 3.07 3.20 3.32

Primary OutFlow Max=4.05 cfs @ 12.02 hrs HW=498.09' (Free Discharge)

- ↑ 1=Culvert (Inlet Controls 4.05 cfs @ 5.16 fps)
- ↑ 2=Orifice/Grate (Passes < 1.84 cfs potential flow)
- ↑ 3=Orifice/Grate (Passes < 3.03 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=495.75' (Free Discharge)

- ↑ 4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.00 hrs HW=495.75' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Stage-Discharge for Pond 1P: DETENTION POND

Elevation (feet)	Discharge (cfs)	Primary (cfs)	Secondary (cfs)	Tertiary (cfs)
495.75	0.00	0.00	0.00	0.00
495.85	0.03	0.03	0.00	0.00
495.95	0.12	0.12	0.00	0.00
496.05	0.26	0.26	0.00	0.00
496.15	0.42	0.42	0.00	0.00
496.25	0.59	0.59	0.00	0.00
496.35	0.71	0.71	0.00	0.00
496.45	0.82	0.82	0.00	0.00
496.55	0.92	0.92	0.00	0.00
496.65	1.00	1.00	0.00	0.00
496.75	1.08	1.08	0.00	0.00
496.85	1.16	1.16	0.00	0.00
496.95	1.23	1.23	0.00	0.00
497.05	1.29	1.29	0.00	0.00
497.15	1.35	1.35	0.00	0.00
497.25	1.41	1.41	0.00	0.00
497.35	1.47	1.47	0.00	0.00
497.45	1.53	1.53	0.00	0.00
497.55	1.91	1.91	0.00	0.00
497.65	2.55	2.55	0.00	0.00
497.75	3.37	3.37	0.00	0.00
497.85	3.78	3.78	0.00	0.00
497.95	3.89	3.89	0.00	0.00
498.05	4.01	4.01	0.00	0.00
498.15	4.12	4.12	0.00	0.00
498.25	4.22	4.22	0.00	0.00
498.35	4.33	4.33	0.00	0.00
498.45	4.43	4.43	0.00	0.00
498.55	4.85	4.53	0.32	0.00
498.65	5.53	4.63	0.91	0.00
498.75	6.41	4.72	1.69	0.00
498.85	7.46	4.81	2.64	0.00
498.95	8.60	4.91	3.69	0.00



Stage-Area-Storage for Pond 1P: DETENTION POND

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
495.75	0	498.40	1,555
495.80	7	498.45	1,614
495.85	16	498.50	1,674
495.90	24	498.55	1,736
495.95	34	498.60	1,799
496.00	45	498.65	1,863
496.05	56	498.70	1,929
496.10	68	498.75	1,996
496.15	81	498.80	2,050
496.20	94	498.85	2,104
496.25	109	498.90	2,160
496.30	124	498.95	2,216
496.35	140	499.00	2,272
496.40	156		
496.45	174		
496.50	192		
496.55	211		
496.60	231		
496.65	251		
496.70	272		
496.75	294		
496.80	317		
496.85	341		
496.90	365		
496.95	390		
497.00	416		
497.05	443		
497.10	471		
497.15	499		
497.20	528		
497.25	558		
497.30	588		
497.35	619		
497.40	652		
497.45	684		
497.50	718		
497.55	754		
497.60	791		
497.65	830		
497.70	870		
497.75	910		
497.80	953		
497.85	996		
497.90	1,040		
497.95	1,086		
498.00	1,132		
498.05	1,180		
498.10	1,230		
498.15	1,281		
498.20	1,333		
498.25	1,386		
498.30	1,441		
498.35	1,497		

Summary for Pond DRIP 01: DRIP EDGE 01

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 907 sf, 100.00% Impervious, Inflow Depth = 3.60" for 10-yr event
 Inflow = 0.11 cfs @ 11.96 hrs, Volume= 272 cf
 Outflow = 0.15 cfs @ 12.01 hrs, Volume= 299 cf, Atten= 0%, Lag= 3.0 min
 Discarded = 0.01 cfs @ 11.05 hrs, Volume= 229 cf
 Tertiary = 0.14 cfs @ 12.01 hrs, Volume= 71 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
 Peak Elev= 505.91' @ 12.00 hrs Surf.Area= 112 sf Storage= 74 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 74.4 min (823.2 - 748.8)

Volume	Invert	Avail.Storage	Storage Description
#1	504.25'	78 cf	Drip Edge (Prismatic) Listed below (Recalc) 196 cf Overall x 40.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
504.25	112	0	0
506.00	112	196	196

Device	Routing	Invert	Outlet Devices
#1	Tertiary	505.90'	45.0' long x 2.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74 2.76 2.89 3.05 3.19 3.32
#2	Discarded	504.25'	2.000 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.01 cfs @ 11.05 hrs HW=504.27' (Free Discharge)
 ↳ **2=Exfiltration** (Exfiltration Controls 0.01 cfs)

Tertiary OutFlow Max=0.11 cfs @ 12.01 hrs HW=505.91' (Free Discharge)
 ↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.25 fps)



Stage-Discharge for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)	Elevation (feet)	Discharge (cfs)	Discarded (cfs)	Tertiary (cfs)
504.25	0.00	0.00	0.00	505.31	0.01	0.01	0.00
504.27	0.01	0.01	0.00	505.33	0.01	0.01	0.00
504.29	0.01	0.01	0.00	505.35	0.01	0.01	0.00
504.31	0.01	0.01	0.00	505.37	0.01	0.01	0.00
504.33	0.01	0.01	0.00	505.39	0.01	0.01	0.00
504.35	0.01	0.01	0.00	505.41	0.01	0.01	0.00
504.37	0.01	0.01	0.00	505.43	0.01	0.01	0.00
504.39	0.01	0.01	0.00	505.45	0.01	0.01	0.00
504.41	0.01	0.01	0.00	505.47	0.01	0.01	0.00
504.43	0.01	0.01	0.00	505.49	0.01	0.01	0.00
504.45	0.01	0.01	0.00	505.51	0.01	0.01	0.00
504.47	0.01	0.01	0.00	505.53	0.01	0.01	0.00
504.49	0.01	0.01	0.00	505.55	0.01	0.01	0.00
504.51	0.01	0.01	0.00	505.57	0.01	0.01	0.00
504.53	0.01	0.01	0.00	505.59	0.01	0.01	0.00
504.55	0.01	0.01	0.00	505.61	0.01	0.01	0.00
504.57	0.01	0.01	0.00	505.63	0.01	0.01	0.00
504.59	0.01	0.01	0.00	505.65	0.01	0.01	0.00
504.61	0.01	0.01	0.00	505.67	0.01	0.01	0.00
504.63	0.01	0.01	0.00	505.69	0.01	0.01	0.00
504.65	0.01	0.01	0.00	505.71	0.01	0.01	0.00
504.67	0.01	0.01	0.00	505.73	0.01	0.01	0.00
504.69	0.01	0.01	0.00	505.75	0.01	0.01	0.00
504.71	0.01	0.01	0.00	505.77	0.01	0.01	0.00
504.73	0.01	0.01	0.00	505.79	0.01	0.01	0.00
504.75	0.01	0.01	0.00	505.81	0.01	0.01	0.00
504.77	0.01	0.01	0.00	505.83	0.01	0.01	0.00
504.79	0.01	0.01	0.00	505.85	0.01	0.01	0.00
504.81	0.01	0.01	0.00	505.87	0.01	0.01	0.00
504.83	0.01	0.01	0.00	505.89	0.01	0.01	0.00
504.85	0.01	0.01	0.00	505.91	0.12	0.01	0.11
504.87	0.01	0.01	0.00	505.93	0.59	0.01	0.58
504.89	0.01	0.01	0.00	505.95	1.25	0.01	1.25
504.91	0.01	0.01	0.00	505.97	2.07	0.01	2.07
504.93	0.01	0.01	0.00	505.99	3.02	0.01	3.01
504.95	0.01	0.01	0.00				
504.97	0.01	0.01	0.00				
504.99	0.01	0.01	0.00				
505.01	0.01	0.01	0.00				
505.03	0.01	0.01	0.00				
505.05	0.01	0.01	0.00				
505.07	0.01	0.01	0.00				
505.09	0.01	0.01	0.00				
505.11	0.01	0.01	0.00				
505.13	0.01	0.01	0.00				
505.15	0.01	0.01	0.00				
505.17	0.01	0.01	0.00				
505.19	0.01	0.01	0.00				
505.21	0.01	0.01	0.00				
505.23	0.01	0.01	0.00				
505.25	0.01	0.01	0.00				
505.27	0.01	0.01	0.00				
505.29	0.01	0.01	0.00				

Stage-Area-Storage for Pond DRIP 01: DRIP EDGE 01

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
504.25	112	0	505.31	112	47
504.27	112	1	505.33	112	48
504.29	112	2	505.35	112	49
504.31	112	3	505.37	112	50
504.33	112	4	505.39	112	51
504.35	112	4	505.41	112	52
504.37	112	5	505.43	112	53
504.39	112	6	505.45	112	54
504.41	112	7	505.47	112	55
504.43	112	8	505.49	112	56
504.45	112	9	505.51	112	56
504.47	112	10	505.53	112	57
504.49	112	11	505.55	112	58
504.51	112	12	505.57	112	59
504.53	112	13	505.59	112	60
504.55	112	13	505.61	112	61
504.57	112	14	505.63	112	62
504.59	112	15	505.65	112	63
504.61	112	16	505.67	112	64
504.63	112	17	505.69	112	65
504.65	112	18	505.71	112	65
504.67	112	19	505.73	112	66
504.69	112	20	505.75	112	67
504.71	112	21	505.77	112	68
504.73	112	22	505.79	112	69
504.75	112	22	505.81	112	70
504.77	112	23	505.83	112	71
504.79	112	24	505.85	112	72
504.81	112	25	505.87	112	73
504.83	112	26	505.89	112	73
504.85	112	27	505.91	112	74
504.87	112	28	505.93	112	75
504.89	112	29	505.95	112	76
504.91	112	30	505.97	112	77
504.93	112	30	505.99	112	78
504.95	112	31			
504.97	112	32			
504.99	112	33			
505.01	112	34			
505.03	112	35			
505.05	112	36			
505.07	112	37			
505.09	112	38			
505.11	112	39			
505.13	112	39			
505.15	112	40			
505.17	112	41			
505.19	112	42			
505.21	112	43			
505.23	112	44			
505.25	112	45			
505.27	112	46			
505.29	112	47			



Summary for Link Dp1: Dp1

Inflow Area = 53,074 sf, 65.56% Impervious, Inflow Depth = 2.82" for 10-yr event
Inflow = 4.22 cfs @ 12.02 hrs, Volume= 12,483 cf
Primary = 4.22 cfs @ 12.02 hrs, Volume= 12,483 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Summary for Link Dp2: Dp2

Inflow Area = 997 sf, 0.00% Impervious, Inflow Depth = 1.28" for 10-yr event
Inflow = 0.05 cfs @ 11.98 hrs, Volume= 106 cf
Primary = 0.05 cfs @ 11.98 hrs, Volume= 106 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs



Summary for Link Dp3: Dp3

Inflow Area = 5,414 sf, 59.99% Impervious, Inflow Depth = 2.48" for 10-yr event
Inflow = 0.52 cfs @ 11.97 hrs, Volume= 1,119 cf
Primary = 0.52 cfs @ 11.97 hrs, Volume= 1,119 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

2.3 NRCS Soils Map





United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and



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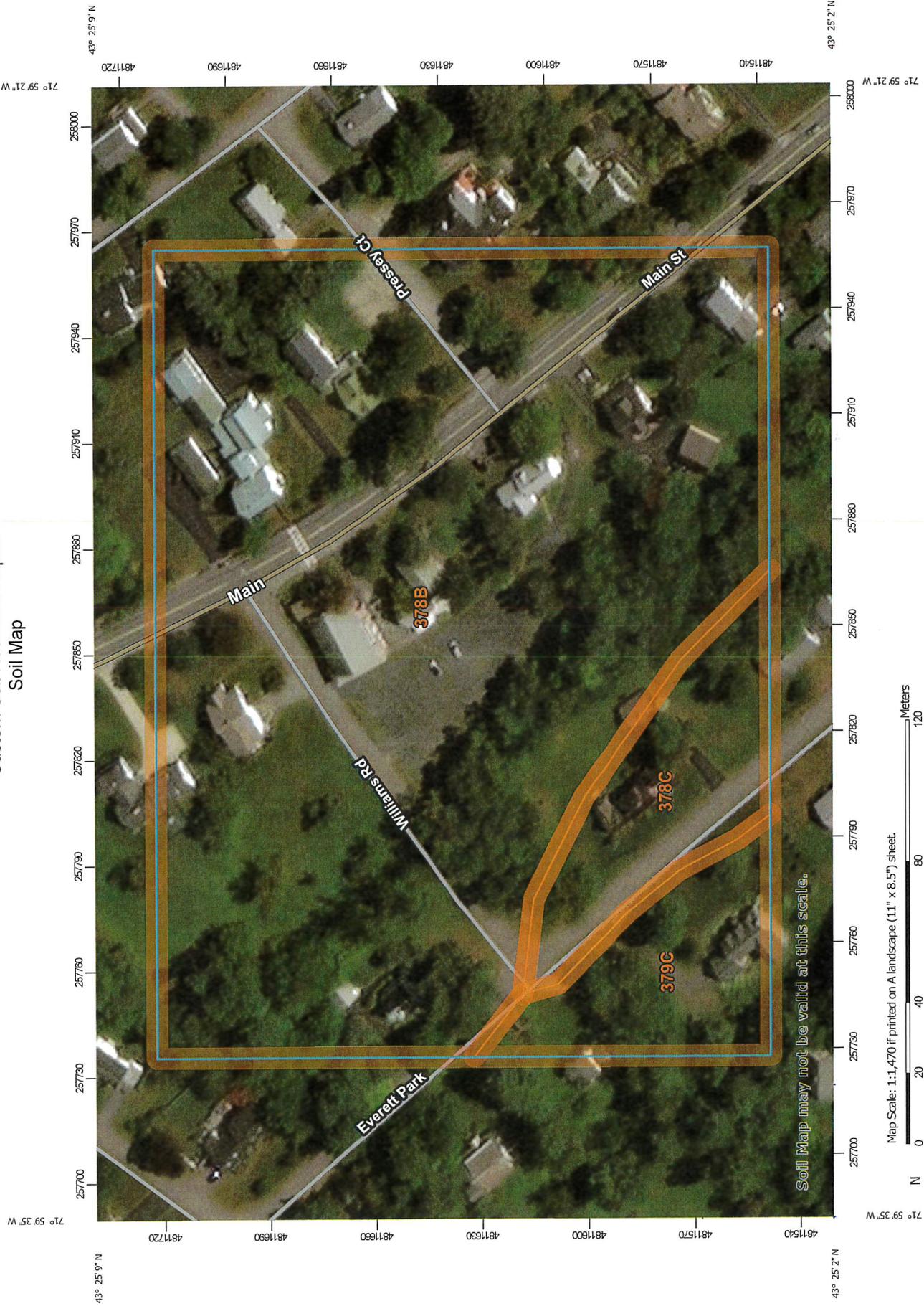
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



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Soil Map



MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
 Survey Area Data: Version 23, Sep 7, 2018

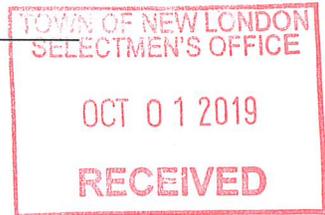
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 11, 2014—Apr 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

- | | |
|------------------------|-----------------------|
| Area of Interest (AOI) | Spoil Area |
| Soils | Stony Spot |
| Soil Map Unit Polygons | Very Stony Spot |
| Soil Map Unit Lines | Wet Spot |
| Soil Map Unit Points | Other |
| Special Point Features | Special Line Features |
| Blowout | Water Features |
| Borrow Pit | Streams and Canals |
| Clay Spot | Transportation |
| Closed Depression | Rails |
| Gravel Pit | Interstate Highways |
| Gravelly Spot | US Routes |
| Landfill | Major Roads |
| Lava Flow | Local Roads |
| Marsh or swamp | Background |
| Mine or Quarry | Aerial Photography |
| Miscellaneous Water | |
| Perennial Water | |
| Rock Outcrop | |
| Saline Spot | |
| Sandy Spot | |
| Severely Eroded Spot | |
| Sinkhole | |
| Slide or Slip | |
| Sodic Spot | |



MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
378B	Peru fine sandy loam, 3 to 8 percent slopes	8.2	83.0%
378C	Peru fine sandy loam, 8 to 15 percent slopes	0.9	9.1%
379C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	0.8	7.9%
Totals for Area of Interest		9.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or



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landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Merrimack and Belknap Counties, New Hampshire

378B—Peru fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2ty5y
Elevation: 230 to 1,770 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Peru and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bhs - 6 to 8 inches: fine sandy loam
Bs1 - 8 to 12 inches: fine sandy loam
Bs2 - 12 to 18 inches: fine sandy loam
Bs3 - 18 to 21 inches: fine sandy loam
BC - 21 to 24 inches: fine sandy loam
Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No



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Minor Components

Marlow

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Colonel

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: No

Cabot

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lyman

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

378C—Peru fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2ty60
Elevation: 330 to 1,870 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days

Custom Soil Resource Report

Farmland classification: Farmland of statewide importance

Map Unit Composition

Peru and similar soils: 83 percent

Minor components: 17 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bhs - 6 to 8 inches: fine sandy loam

Bs1 - 8 to 12 inches: fine sandy loam

Bs2 - 12 to 18 inches: fine sandy loam

Bs3 - 18 to 21 inches: fine sandy loam

BC - 21 to 24 inches: fine sandy loam

Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 20 to 39 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 16 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Colonel

Percent of map unit: 7 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, nose slope, interfluve, side slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Linear, concave



Custom Soil Resource Report

Across-slope shape: Concave

Hydric soil rating: No

Marlow

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, nose slope, side slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Cabot

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, side slope, interfluve, nose slope

Microfeatures of landform position: Open depressions, closed depressions, closed depressions, open depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Tunbridge

Percent of map unit: 2 percent

Landform: Mountains, hills

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, nose slope, side slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

379C—Peru fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty65

Elevation: 360 to 2,160 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of local importance

Map Unit Composition

Peru, very stony, and similar soils: 84 percent

Minor components: 16 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: fine sandy loam

E - 5 to 6 inches: fine sandy loam

Bs1 - 6 to 7 inches: fine sandy loam

Bs2 - 7 to 13 inches: fine sandy loam

Bs3 - 13 to 18 inches: fine sandy loam

BC - 18 to 21 inches: fine sandy loam

Cd1 - 21 to 37 inches: fine sandy loam

Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 1.1 percent

Depth to restrictive feature: 21 to 43 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 17 to 34 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Marlow, very stony

Percent of map unit: 6 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No



Custom Soil Resource Report

Cabot, very stony

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Lyman, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, side slope, nose slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Colonel, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Linear, concave

Across-slope shape: Concave

Hydric soil rating: No

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2.4 Infiltration Feasibility Report





**INFILTRATION FEASIBILITY REPORT
NEW LONDON BARN PLAYHOUSE
NEW LONDON, NEW HAMPSHIRE**

SEPTEMBER 2019

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- II. EXISTING TOPOGRAPHY AT THE PRACTICE LOCATION**
- III. TEST PIT LOCATIONS**
- IV. SEASONAL HIGH WATER AND BEDROCK ELEVATION**
- V. TEST PIT AND TEST BORING LOGS**
- VI. DESIGN INFILTRATION RATE**

**PROJECT NO. 18865
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I. LOCATION OF THE PRACTICES

New London Barn Playhouse plans to construct a new 2,330 square foot building to the south for rehearsals/production, and new interior renovations of the existing 'Red House'. The proposed new building will be connected to the existing 'Red House' via a new connector hallway. The proposed project also includes a new smaller addition to the existing 'Barn' Playhouse -for tickets/concession/bathrooms/ and hallway on the ground floor addition. Additional project components include parking lot and walkway modifications, minor site grading, and landscaping. The proposed stormwater plan includes two new ditches along the western and southern edge of the parking lot which will direct runoff to a new micropool, extended detention pond, 'P-1P'. Refer to **Appendix A** for a Site Plan.

II. EXISTING TOPOGRAPHY AT THE PRACTICE LOCATIONS

The existing property is a previously developed lot with existing parking lot and walkways. The site generally slopes to the western edge of the property between 3-8% slopes.

III. TEST PIT LOCATIONS

One (1) test pit was excavated in total for the site investigation on August 16, 2019. The following table indicates the test pit excavation and respective locations:

Test Pit	Location Description
TP-1	Southwest corner of property, near proposed stormwater pond.

The test pits were excavated to determine soil types, the depth to estimated seasonal high water table (ESHWT), and depth to bedrock or other restrictive layer. The test pits were excavated by Phelps Construction of Danbury, New Hampshire and logged by Chris Hernick and Joel Banaszak of Horizons Engineering, Inc.

IV. SEASONAL HIGH WATER AND BEDROCK ELEVATION

TP-1

Ground at the test pit = elev 497.35
Pit bottom at 64" = elev 492.02
No bedrock observed
Seepage observed at 60" = elev 492.35
ESHWT: 22" = elev 495.52

V. TEST PIT AND TERST BORING LOGS

Detailed test pit logs were prepared for each excavation as described in Env-Wq 1504.13 (d). Refer to **Appendix B** for a copy of **Test Pit Logs**.



VI. DESIGN INFILTRATION RATE

The infiltration rate was determined from Geulph Permeameter Infiltration tests as described in Env-Wq 1504.14 (e) (4). The tests were completed on August 16, 2019 by Horizons personnel. The test sheets are attached.

P-1P (TP-1)

Depth of test: 12"

Rates of Change: 1.0 cm/min, 2.0 cm/min, 0.7 cm/min, 1.5 cm/min

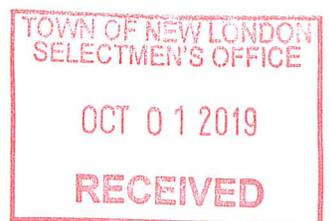
Calculated rate = 2.122"/hr

Based on the results of the test pit excavation and the estimated depth to the seasonal high water table (ESHWT) restrictions, the results indicate that the site soil is not capable of absorbing stormwater runoff at the location of the proposed stormwater pond. Field measurements were completed to determine design infiltration rates. Refer to **Appendix C** for **Geulph Permeameter Results**.

Appendix A – Site Plan

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Appendix B – Test Pit Logs





Horizons Engineering, Inc.
 176 Newport Road, P.O. Box 1825
 New London, New Hampshire 03257

Test Pit Log No.: TP-1

Date: 8/16/2019

Project: Playhouse Site Plan

Project No.: 18865

Client: New London Barn Playhouse

Subcontractor: N/A

Operator: K. Warzocha

Inspector: C. Hernick, J. Banaszak

Site Conditions

Overcast, light rain,
60s-70s

Equipment

Kubota KX91-3

Test Pit Location

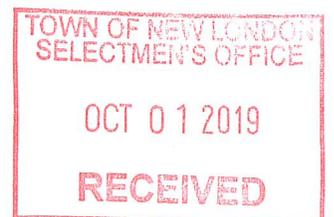
Proposed detention pond
 Southwest corner of property

Depth	Sketch	Description	Digging Effort (Easy, Moderate, Difficult)	Other
0-6"		Very dark grayish brown (10YR 3/2) FINE SANDY LOAM, organic topsoil. Non-cohesive, massive, friable. Abundant roots. Dry	E	
6-22"		Dark yellowish brown (10YR 3/6) FINE SANDY LOAM. Some pebbles <10% Massive, friable. Mildly cohesive. Fine roots. Dry.	E	
22-64"		Light yellowish brown (2.5Y 6/3) FINE LOAMY SAND. <10% gravel. Firm in place, blocky. Mottles throughout, dark yellowish brown (10YR 4/6). No roots. Dry.	M	

Summary:

Root penetration to 22"
 No refusal to depth. No ledge to depth.
 Seepage observed at 60".
 Estimated seasonal high water: 22"; texture and color change, termination of roots.
 Infiltration test completed at 12"

Appendix C – Geulph Permeameter Results



2.5 Inspection and Maintenance Manual



GUELPH PERMEAMETER CALCULATIONS

COMBINED RESERVOIR

HEI Project Name: **NL BARN PLAYHOUSE**
HEI Project Number: **18865**
Test Location: **TP #1**
Test Date: **8/16/2019**
Performed by: **K. WARZOCHA**

Enter the soil texture-structure category (enter one of the below numbers): 2

1. Compacted, Structure-less, clayey or silty materials, such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soil which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also included unstructured medium and fine sands. The category most frequently applicable to agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

TEST 1 TEST 2 TEST 3

Enter the first water Head Height ("H1"): 5 5 cm
 Enter the second water Head Height ("H2"): 10 10 cm
 Enter the Borehole Radius ("a"): 3 3 cm
 Steady State Rate of Water Level Change ("R1"): 1.000 0.700 cm/min
 Steady State Rate of Water Level Change ("R2"): 2.000 1.500 cm/min

AVERAGE

1.62E-03	1.37E-03	cm/sec
9.74E-02	8.22E-02	cm/min
1.62E-05	1.37E-05	m/sec
38.35E-03	32.37E-03	inch/min
2.301	1.942	inch/hr

KEY:

Input
 Result

$K_{fs} =$

$\phi_m =$

4.16E-03 cm²/min

Spreadsheet simplified from Soil Moisture Equipment Corp. Guelph Permeameter Calculations spreadsheet.

See reference worksheet for formulae.



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Frequency of Activities

The best time to perform inspections is during the onset of rain. To the extent practicable inspections should be timed to coincide with moderate storms that do not have the potential for severe (thunderstorms, etc.) precipitation. The frequency of inspection and maintenance will vary by intensity of use; however the following shall serve as the minimum inspection frequency:

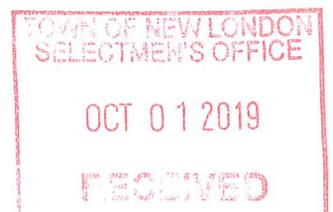
- Drip Edges should be inspected and cleaned at least twice annually in the spring and fall.
- Detention Ponds should be inspected and cleaned at least twice annually in the spring and fall.

Maintenance frequencies will be determined based upon the results of the inspections and if specific maintenance thresholds are observed to have been crossed during inspections.

All inspection activities shall be recorded on the appropriate attached Inspection Form. One form shall be used for each stormwater device.

Records

A record of inspection and maintenance activities shall be recorded on the Inspection and Maintenance Log presented following. Records of Inspection Forms and Inspection and Maintenance Logs shall be made available upon request.



2.3 NRCS Soils Map





A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Merrimack and Belknap Counties, New Hampshire



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and



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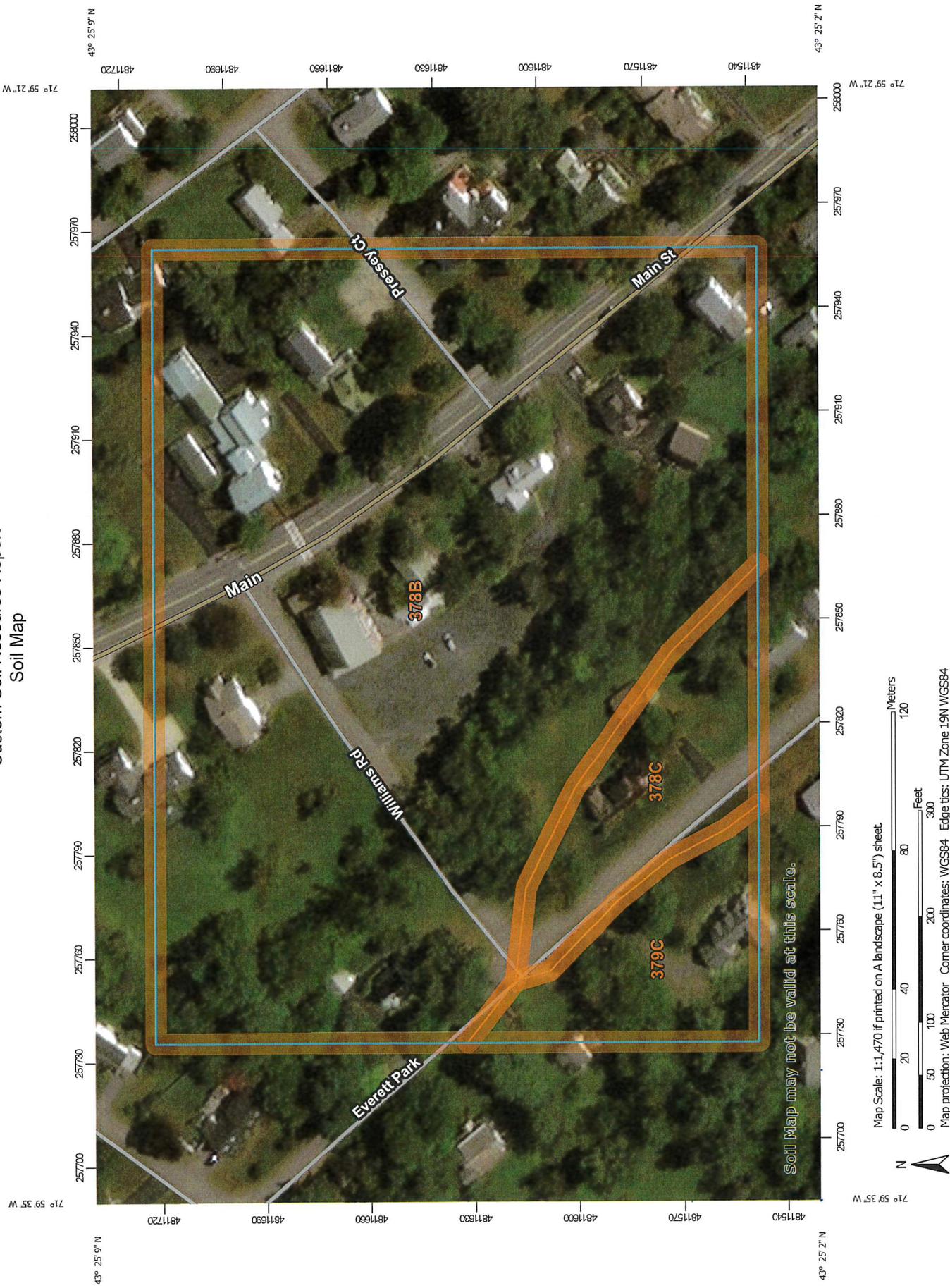
identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



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Soil Map



Soil Map may not be valid at this scale.

Map Scale: 1:1,470 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Merrimack and Belknap Counties, New Hampshire
 Survey Area Data: Version 23, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 11, 2014—Apr 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

- Area of Interest (AOI)
- Spoil Area
- Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features
- Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Water Features
- Streams and Canals
- Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads
- Background
- Aerial Photography

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MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
378B	Peru fine sandy loam, 3 to 8 percent slopes	8.2	83.0%
378C	Peru fine sandy loam, 8 to 15 percent slopes	0.9	9.1%
379C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	0.8	7.9%
Totals for Area of Interest		9.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or



Custom Soil Resource Report

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Merrimack and Belknap Counties, New Hampshire

378B—Peru fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2ty5y
Elevation: 230 to 1,770 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Peru and similar soils: 84 percent
Minor components: 16 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru

Setting

Landform: Hills, mountains
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainbase, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bhs - 6 to 8 inches: fine sandy loam
Bs1 - 8 to 12 inches: fine sandy loam
Bs2 - 12 to 18 inches: fine sandy loam
Bs3 - 18 to 21 inches: fine sandy loam
BC - 21 to 24 inches: fine sandy loam
Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 16 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

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Minor Components

Marlow

Percent of map unit: 6 percent
Landform: Hills, mountains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Colonel

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Foothlope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: No

Cabot

Percent of map unit: 4 percent
Landform: Hills, mountains
Landform position (two-dimensional): Toeslope, foothlope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Closed depressions, closed depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Lyman

Percent of map unit: 2 percent
Landform: Hills, mountains
Landform position (two-dimensional): Shoulder, summit, backslope
Landform position (three-dimensional): Mountainbase, interfluve
Microfeatures of landform position: Rises, rises
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

378C—Peru fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2ty60
Elevation: 330 to 1,870 feet
Mean annual precipitation: 31 to 95 inches
Mean annual air temperature: 27 to 52 degrees F
Frost-free period: 90 to 160 days

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Farmland classification: Farmland of statewide importance

Map Unit Composition

Peru and similar soils: 83 percent

Minor components: 17 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Ap - 0 to 6 inches: fine sandy loam

Bhs - 6 to 8 inches: fine sandy loam

Bs1 - 8 to 12 inches: fine sandy loam

Bs2 - 12 to 18 inches: fine sandy loam

Bs3 - 18 to 21 inches: fine sandy loam

BC - 21 to 24 inches: fine sandy loam

Cd - 24 to 65 inches: sandy loam

Properties and qualities

Slope: 8 to 15 percent

Depth to restrictive feature: 20 to 39 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 16 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Colonel

Percent of map unit: 7 percent

Landform: Mountains, hills

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, nose slope, interfluve, side slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Linear, concave



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Across-slope shape: Concave

Hydric soil rating: No

Marlow

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, nose slope, side slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Cabot

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, side slope, interfluve, nose slope

Microfeatures of landform position: Open depressions, closed depressions, closed depressions, open depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Tunbridge

Percent of map unit: 2 percent

Landform: Mountains, hills

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, nose slope, side slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

379C—Peru fine sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2ty65

Elevation: 360 to 2,160 feet

Mean annual precipitation: 31 to 95 inches

Mean annual air temperature: 27 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Farmland of local importance

Map Unit Composition

Peru, very stony, and similar soils: 84 percent

Minor components: 16 percent

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Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Peru, Very Stony

Setting

Landform: Hills, mountains

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 5 inches: fine sandy loam

E - 5 to 6 inches: fine sandy loam

Bs1 - 6 to 7 inches: fine sandy loam

Bs2 - 7 to 13 inches: fine sandy loam

Bs3 - 13 to 18 inches: fine sandy loam

BC - 18 to 21 inches: fine sandy loam

Cd1 - 21 to 37 inches: fine sandy loam

Cd2 - 37 to 65 inches: fine sandy loam

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 1.1 percent

Depth to restrictive feature: 21 to 43 inches to densic material

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)

Depth to water table: About 17 to 34 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C/D

Hydric soil rating: No

Minor Components

Marlow, very stony

Percent of map unit: 6 percent

Landform: Hills, mountains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No



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Cabot, very stony

Percent of map unit: 4 percent

Landform: Mountains, hills

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Lyman, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Mountainflank, mountainbase, interfluve, side slope, nose slope

Microfeatures of landform position: Rises, rises

Down-slope shape: Convex

Across-slope shape: Convex

Hydric soil rating: No

Colonel, very stony

Percent of map unit: 3 percent

Landform: Hills, mountains

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Mountainbase, mountainflank, interfluve, side slope, nose slope

Microfeatures of landform position: Closed depressions, open depressions, open depressions, closed depressions

Down-slope shape: Linear, concave

Across-slope shape: Concave

Hydric soil rating: No

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2.4 Infiltration Feasibility Report





**INFILTRATION FEASIBILITY REPORT
NEW LONDON BARN PLAYHOUSE
NEW LONDON, NEW HAMPSHIRE**

SEPTEMBER 2019

TABLE OF CONTENTS

- I. LOCATION OF THE PRACTICE**
- II. EXISTING TOPOGRAPHY AT THE PRACTICE LOCATION**
- III. TEST PIT LOCATIONS**
- IV. SEASONAL HIGH WATER AND BEDROCK ELEVATION**
- V. TEST PIT AND TEST BORING LOGS**
- VI. DESIGN INFILTRATION RATE**

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I. LOCATION OF THE PRACTICES

New London Barn Playhouse plans to construct a new 2,330 square foot building to the south for rehearsals/production, and new interior renovations of the existing 'Red House'. The proposed new building will be connected to the existing 'Red House' via a new connector hallway. The proposed project also includes a new smaller addition to the existing 'Barn' Playhouse -for tickets/concession/bathrooms/ and hallway on the ground floor addition. Additional project components include parking lot and walkway modifications, minor site grading, and landscaping. The proposed stormwater plan includes two new ditches along the western and southern edge of the parking lot which will direct runoff to a new micropool, extended detention pond, 'P-1P'. Refer to **Appendix A** for a Site Plan.

II. EXISTING TOPOGRAPHY AT THE PRACTICE LOCATIONS

The existing property is a previously developed lot with existing parking lot and walkways. The site generally slopes to the western edge of the property between 3-8% slopes.

III. TEST PIT LOCATIONS

One (1) test pit was excavated in total for the site investigation on August 16, 2019. The following table indicates the test pit excavation and respective locations:

Test Pit	Location Description
TP-1	Southwest corner of property, near proposed stormwater pond.

The test pits were excavated to determine soil types, the depth to estimated seasonal high water table (ESHWT), and depth to bedrock or other restrictive layer. The test pits were excavated by Phelps Construction of Danbury, New Hampshire and logged by Chris Hernick and Joel Banaszak of Horizons Engineering, Inc.

IV. SEASONAL HIGH WATER AND BEDROCK ELEVATION

TP-1

Ground at the test pit = elev 497.35
Pit bottom at 64" = elev 492.02
No bedrock observed
Seepage observed at 60" = elev 492.35
ESHWT: 22" = elev 495.52

V. TEST PIT AND TERST BORING LOGS

Detailed test pit logs were prepared for each excavation as described in Env-Wq 1504.13 (d). Refer to **Appendix B** for a copy of **Test Pit Logs**.



VI. DESIGN INFILTRATION RATE

The infiltration rate was determined from Geulph Permeameter Infiltration tests as described in Env-Wq 1504.14 (e) (4). The tests were completed on August 16, 2019 by Horizons personnel. The test sheets are attached.

P-1P (TP-1)

Depth of test: 12"

Rates of Change: 1.0 cm/min, 2.0 cm/min, 0.7 cm/min, 1.5 cm/min

Calculated rate = 2.122"/hr

Based on the results of the test pit excavation and the estimated depth to the seasonal high water table (ESHWT) restrictions, the results indicate that the site soil is not capable of absorbing stormwater runoff at the location of the proposed stormwater pond. Field measurements were completed to determine design infiltration rates. Refer to **Appendix C** for **Geulph Permeameter Results**.

Appendix A – Site Plan

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SITE DATA

EXISTING USE: THEATER
 PROPOSED USE: THEATER

PROPOSED DIMENSIONS
 LOT AREA: 51,753 SF
 FRONT SETBACK: 25 FT
 SIDE SETBACK: 15 FT
 REAR SETBACK: 15 FT
 MIN. % LANDSCAPED OPEN AREA: 65%
 TOTAL WATER REQUEST (FOR ALL PROPOSED OPEN AREAS): 1,000 GPD

PARKING SUMMARY

REQUIRED PARKING: 20 SPACES
 PROVIDED PARKING: 20 SPACES

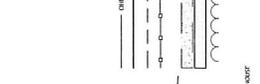
SNOW STORAGE NOTE

NEW LONDON SITE PLAN REVIEW REGULATIONS REQUIRE ALL DRIVEWAYS AND DRIVEWAY AREAS TO BE PROVIDED WITH SNOW STORAGE AS SHOWN.

NOTES

- TEST PITS REQUIRED TO VERIFY ELEVATION OF EXISTING WATER MAINS AND BOTTOM OF STONE SETTING WALL FOOTER. PLACE 12" DEPTH COMPACTED SAND BELOW WALL OF FOOTER AT ALL LOCATIONS.
- REMOVE EXISTING EXPOSURE FOR POSSIBLE POLE RELOCATION 45' TO THE NORTH.

LEGEND



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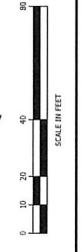
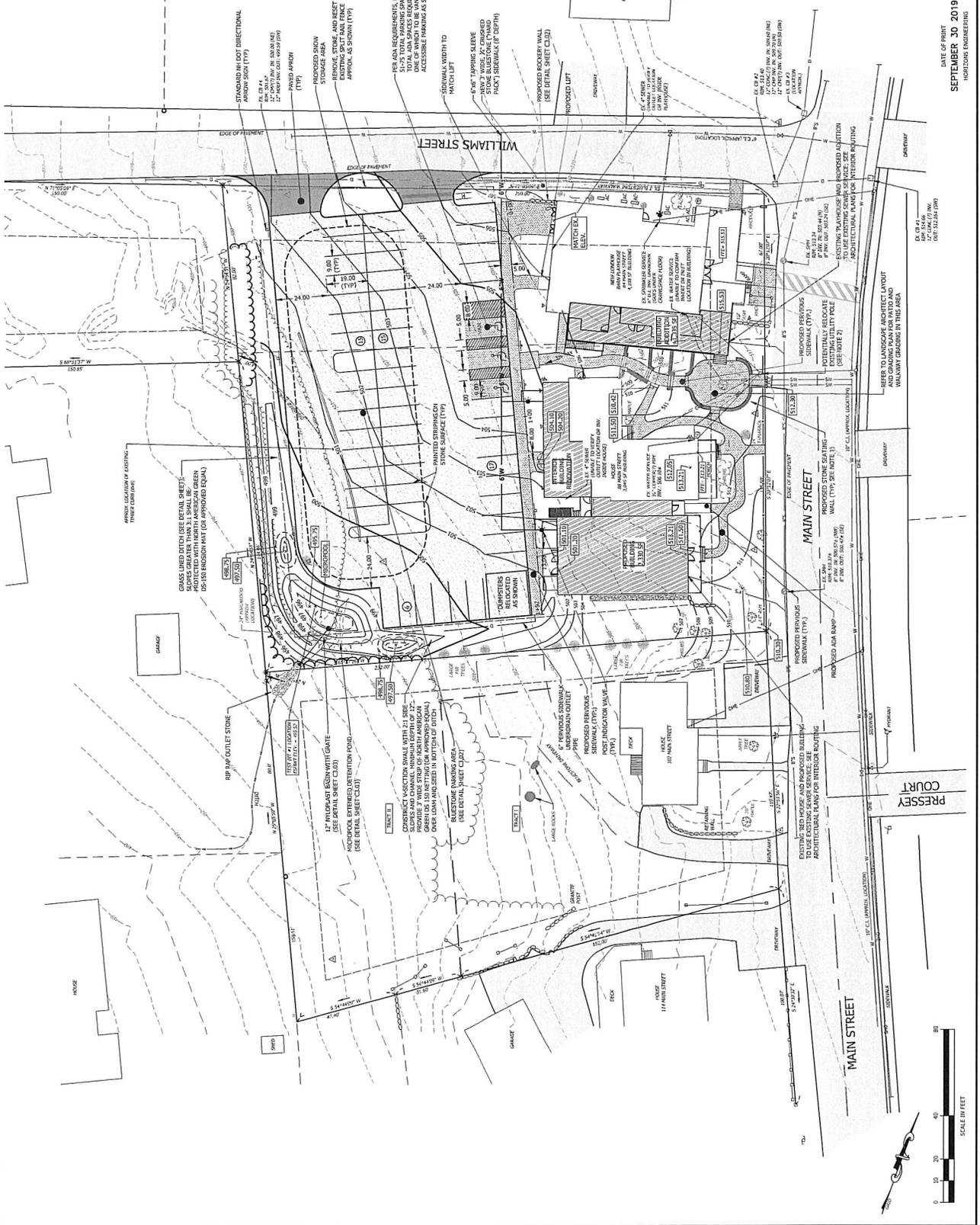
1000 Main Street, New London, CT 06320
 860-439-1111

NEW LONDON BARN PLAYHOUSE, INC.
 PLAYHOUSE SITE PLAN
 NEW LONDON, NEW HAMPSHIRE

PROPOSED SITE PLAN

NO.	DATE	REVISION DESCRIPTION	BY	CHK

DATE OF PRINT: SEPTEMBER 30 2019
 PROJECT NO: 18885-FLA-NH-0510-01-01
 SHEET NO: C2.01



Appendix B – Test Pit Logs





Horizons Engineering, Inc.
 176 Newport Road, P.O. Box 1825
 New London, New Hampshire 03257

Test Pit Log No.: TP-1

Date: 8/16/2019

Project: Playhouse Site Plan

Project No.: 18865

Client: New London Barn Playhouse

Subcontractor: N/A

Operator: K. Warzocha

Inspector: C. Hernick, J. Banaszak

<u>Site Conditions</u>	<u>Equipment</u>	<u>Test Pit Location</u>
Overcast, light rain, 60s-70s	Kubota KX91-3	Proposed detention pond Southwest corner of property

Depth	Sketch	Description	Digging Effort (Easy, Moderate, Difficult)	Other
0-6"		Very dark grayish brown (10YR 3/2) FINE SANDY LOAM, organic topsoil. Non-cohesive, massive, friable. Abundant roots. Dry	E	
6-22"		Dark yellowish brown (10YR 3/6) FINE SANDY LOAM. Some pebbles <10% Massive, friable. Mildly cohesive. Fine roots. Dry.	E	
22-64"		Light yellowish brown (2.5Y 6/3) FINE LOAMY SAND. <10% gravel. Firm in place, blocky. Mottles throughout, dark yellowish brown (10YR 4/6). No roots. Dry.	M	

Summary:

Root penetration to 22"
 No refusal to depth. No ledge to depth.
 Seepage observed at 60".
 Estimated seasonal high water: 22"; texture and color change, termination of roots.
 Infiltration test completed at 12"

Appendix C – Geulph Permeameter Results

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GUELPH PERMEAMETER CALCULATIONS

COMBINED RESERVOIR

HEI Project Name: **NL BARN PLAYHOUSE**
 HEI Project Number: **18865**
 Test Location: **TP #1**
 Test Date: **8/16/2019**
 Performed by: **K. WARZOCHA**

Enter the soil texture-structure category (enter one of the below numbers): **2**

1. Compacted, Structure-less, clayey or silty materials, such as landfill caps and liners, lacustrine or marine sediments, etc.
2. Soil which are both fine textured (clayey or silty) and unstructured; may also include some fine sands.
3. Most structured soils from clays through loams; also included unstructured medium and fine sands. The category most frequently applicable to agricultural soils.
4. Coarse and gravely sands; may also include some highly structured soils with large and/or numerous cracks, macropores, etc.

TEST 1 TEST 2 TEST 3

Enter the first water Head Height ("H1"): **5 5** **5** *cm*

Enter the second water Head Height ("H2"): **10 10** **10** *cm*

Enter the Borehole Radius ("a"): **3 3** **3** *cm*

Steady State Rate of Water Level Change ("R1"): **1.000 0.700** **0.700** *cm/min*

Steady State Rate of Water Level Change ("R2") : **2.000 1.500** **1.500** *cm/min*

AVERAGE

1.62E-03	1.37E-03	1.37E-03	cm/sec
9.74E-02	8.22E-02	8.22E-02	cm/min
1.62E-05	1.37E-05	1.37E-05	m/sec
38.35E-03	32.37E-03	32.37E-03	inch/min
2.301	1.942	1.942	inch/hr

KEY:

Input
 Result

$K_f =$

$\phi_m =$

4.16E-03 **4.16E-03** **cm² /min**



2.5 Inspection and Maintenance Manual



Frequency of Activities

The best time to perform inspections is during the onset of rain. To the extent practicable inspections should be timed to coincide with moderate storms that do not have the potential for severe (thunderstorms, etc.) precipitation. The frequency of inspection and maintenance will vary by intensity of use; however the following shall serve as the minimum inspection frequency:

- Drip Edges should be inspected and cleaned at least twice annually in the spring and fall.
- Detention Ponds should be inspected and cleaned at least twice annually in the spring and fall.

Maintenance frequencies will be determined based upon the results of the inspections and if specific maintenance thresholds are observed to have been crossed during inspections.

All inspection activities shall be recorded on the appropriate attached Inspection Form. One form shall be used for each stormwater device.

Records

A record of inspection and maintenance activities shall be recorded on the Inspection and Maintenance Log presented following. Records of Inspection Forms and Inspection and Maintenance Logs shall be made available upon request.



DP- DETENTION POND



Inspection Frequency:

Inspect 2 times per year (spring and fall-after leaf drop) unless otherwise described- maintain features as described below

Maintenance Requirements:

- Conduct periodic mowing of embankments (minimum-two times per year) to control growth of woody vegetation on embankments.
- Remove debris and sediment from inlet and outlet structures at least annually.
- Where an emergency overflow weir exists.
 - The weir should be maintained to ensure it is level.
 - Stone surfacing should be intact (not eroding).
 - Removal all sediment, leaves, sticks and debris.
- Install and maintain a durable staff gage or other measuring device to indicate depth of sediment accumulation and level at which clean-out is required.
 - At a minimum, sediment should be cleaned out when sediment depth is one half the height from pond floor to invert out of the basin.
- Remove and dispose of accumulated sediment based on inspection.
 - If lowering the water surface of the detention pond is needed to facilitate maintenance:
 - Pick a period of time when dry weather is anticipated to continue
 - Pump or drain pond slowly (ideally lowering pond no more than 6"-8" per day) and with suction end of dewatering hose in a bucket or suspended off of the bottom of the pond to minimized sediment loss.
 - Discharge water to a vegetated area as far as possible from wetlands and streams (minimum of 20 feet).
 - Place sheet of plywood or plastic sheeting under discharge end of hose to minimize scour at discharge end of hose.
 - Check to ensure that at the point that the discharge water enters a wetland that it is not cloudy.
- Where stands of aquatic vegetation cover more than $\frac{1}{2}$ pond surface cut and remove such vegetation (particularly near pond inlets and outlets) such that no more than $\frac{1}{2}$ of the pond surface is covered.
 - After vegetation has been harvested and pond refills from a storm check to make sure that cuttings (missed during removal activities) do not block outlets or inlets.



SF- SEDIMENT FOREBAY



Inspection Frequency:

Inspect 2 times per year (spring and fall-after leaf drop) unless otherwise described- maintain features as described below.

Maintenance Requirements:

- Conduct periodic mowing of embankments (minimum-two times per year) to control growth of woody vegetation on embankments.
- Remove debris from sediment forebay inlet and outlet structures at least annually.
- Where outlet from the forebay is a weir.
 - The weir should be maintained to ensure it is level.
 - Stone surfacing should be intact (not eroding).
- Install and maintain a durable staff gage or other measuring device to indicate depth of sediment accumulation and level at which clean-out is required.
 - At a minimum, sediment should be cleaned out when sediment depth is one half the height from forebay floor to invert out of the basin.
- Remove and dispose of accumulated sediment based on inspection.

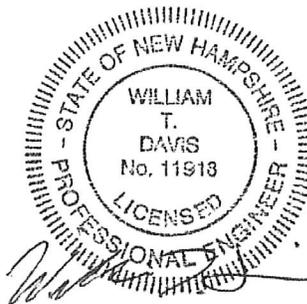
2.7 References Preparer's Certification



REFERENCES

- Mays, Larry. *Stormwater Collection Systems Design Handbook*. McGraw-Hill. New York, NY. 2001
- McCarthy, David. *Essentials of Soil Mechanics and Foundations: Sixth Edition*. Prentice Hall. Columbus, Ohio. 2002.
- NHDES. *New Hampshire Stormwater Manual*. New Hampshire Department of Environmental Services. 2008.
- NHDES. *New Hampshire Homeowner's Guide to Stormwater Management*. New Hampshire Department of Environmental Services. 2012
- The UNH Stormwater Center, *The LID Stormwater Management Systems Demonstrate LID Stormwater Management Systems Demonstrate Superior Cold Climate Performance than Superior Cold Climate Performance than Conventional Stormwater Management Systems.* UNH Stormwater Center, NEIWPC 2007 NPS Conference, Newport, RI, May 2007

PREPARER'S CERTIFICATION



Prepared by William T. Davis, PE

SECTION 3.0 – PLANS

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3.1 Design Plans

(Unbound)

**This Section Left Intentionally Blank
(Plans Bound Separately)**



3.2 Pre- & Post-Development Drainage Area Plans

BARN PLAYHOUSE

NEW LONDON, NH 03257

SITE LOCATION: 84 MAIN STREET
NEW LONDON, NH 03257

OWNER: NEW LONDON BARN PLAYHOUSE
84 MAIN STREET
Po. BOX 9, NEW LONDON, NH 03257

ARCHITECT: FRANK ANZALONE ASSOCIATES
224 MAIN STREET
PO BOX 1016
NEW LONDON, NH 03257
PHONE: 603.526.8911
FAX: 603.526.8922
info@faa-arch.com

LIST OF DRAWINGS

C1.01	EXISTING CONDITIONS	EC-1.1	EXISTING LOWER LEVEL
C2.01	PROPOSED SITE PLAN	EC-1.2	EXISTING MAIN LEVEL
C3.01	EROSION CONTROL NOTES AND DETAILS	EC-1.3	EXISTING BALCONY PLAN
C3.02	STANDARD SANITARY SEWER AND WATER SYSTEM NOTES AND DETAILS	EC-1.5	EXISTING ROOF PLAN
C3.03	MISCELLANEOUS DETAILS	EC-1.5	EXISTING LOWER LEVEL
A-1.1	PROPOSED LOWER LEVEL	EC-1.6	EXISTING FIRST FLOOR
A-1.2	PROPOSED FLOOR PLAN	EC-1.7	EXISTING SECOND FLOOR
A-1.3	B.P.H. MAIN FLOOR	EC-1.8	EXISTING ROOF PLAN
A-1.4	B.P.H. LOWER LEVEL	EC-2.1	EXISTING ELEVATIONS
A-1.5	RED HOUSE MAIN FLOOR	EC-2.2	EXISTING ELEVATIONS
A-1.6	RED HOUSE LOWER LEVEL		
A-1.7	REHEARSAL LOWER LEVEL		
A-1.8	REHEARSAL MAIN FLOOR		
A-2.1	PROPOSED ELEVATIONS		
A-2.2	PROPOSED ELEVATIONS		



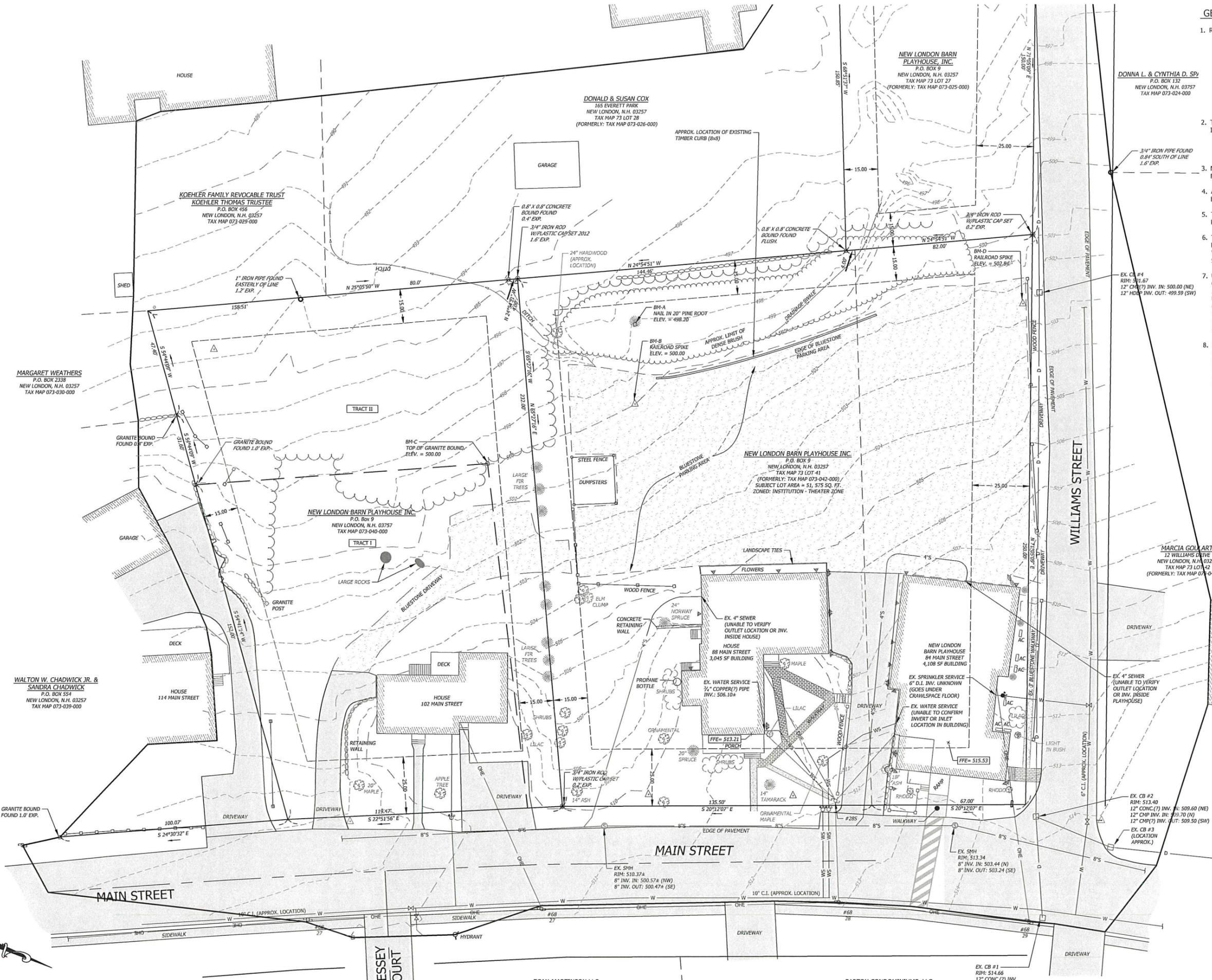
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GENERAL NOTES

- REFERENCE PLANS:
 - "BOUNDARY SURVEY AND SITE PLAN" FOR PROPERTY OF NEW LONDON PLAYHOUSE, INC. LOCATED AT 84 AND 88 MAIN STREET NEW LONDON HAMPSHIRE, DATED DECEMBER 31, 2012 AND PREPARED BY PIERRE J. B. AND ASSOCIATES, P.C., P.O. BOX 238, WILMOT, N.H. 03287.
 - "BOUNDARY SURVEY AND SITE PLAN" FOR PROPERTY OF NEW LONDON PLAYHOUSE, INC. LOCATED AT 102 MAIN STREET NEW LONDON HAMPSHIRE, DATED MAY 7, 2015 AND PREPARED BY PIERRE J. B. AND ASSOCIATES, P.C., P.O. BOX 238, WILMOT, N.H. 03287.
- THE NEW LONDON BARN PLAYHOUSE, INC. PROPERTY IS LOCATED IN THE INSTITUTION-THEATER ZONING DISTRICT AND THE FOLLOWING SETBACKS:
 - 25 FT FRONT SETBACK
 - 15 FT REAR SETBACK
 - 15 FT SIDE SETBACK
- NO EXISTING MONUMENTS, BOUNDS, OR BENCHMARKS SHALL BE DISTURBED FIRST MAKING PROVISIONS FOR RELOCATION.
- ALL WORK SHALL BE PERFORMED WITHIN THE PROPERTY OF, AND EASEMENTS BY, THE OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DATA COLLECTION AND PREPARATION OF RECORD DRAWINGS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONTROLLING EROSION DISTURBED BY HIS ACTIONS. COSTS FOR REQUIRED EROSION CONTROL, WHETHER OR NOT SUCH MEASURES ARE SHOWN ON THE ENGINEERING DRAWING SHALL BE BORNE BY HIM.
- UTILITY LOCATIONS ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF EXISTING UTILITIES ENCOUNTERED SHALL BE LOCATED BY DEPTH AND TIES AND THE CONTRACTOR ON HIS "AS BUILT" DRAWINGS. HAND EXCAVATION SHALL BE PERFORMED WHEREVER UNDERGROUND UTILITIES ARE SHOWN OR ANTICIPATED. THE CONTRACTOR SHALL CONTACT DIG SAFE AND THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION IN ORDER TO VERIFY EXISTING CONDITIONS AND UTILITIES.
- BASE MAP INFORMATION INCLUDING BOUNDARY AND TOPOGRAPHY ON THIS DRAWING IS BASED ON A SURVEY COMPLETED BY PIERRE J. B. AND ASSOCIATES, P.C. IN DECEMBER, 2012 AND A SURVEY COMPLETED IN MAY, 2015 AND BOTH A CONTROL TRAVERSE RELATIVE ERROR OF CLOSURE GREATER THAN 1:1000 (NH CATEGORY 1, CONDITION 2, RURAL).

LEGEND

- STONE RETAINING WALL
-
- GRANITE BOUND (FOUND)
-
- WATER SHUT OFF
- WATER GATE VALVE
- CATCH BASIN
- SEWER MANHOLE
- LIGHT
- UTILITY POLE AND NUMBER
- OVERHEAD UTILITY LINE
- PROPERTY LINE
- ABUTTERS PROPERTY LINE
- WOODEN FENCE
- EXISTING MAJOR / MINOR
- EXISTING GRAVEL DRIVE
- EXISTING PAVED AREA
- TREELINE
- DECIDUOUS TREE
- CONIFEROUS TREE



MARGARET WEATHERS
P.O. BOX 2338
NEW LONDON, N.H. 03257
TAX MAP 073-030-000

WALTON W. CHADWICK JR. & SANDRA CHADWICK
P.O. BOX 564
NEW LONDON, N.H. 03257
TAX MAP 073-039-000

DONALD & SUSAN COX
165 EVERETT BLVD
NEW LONDON, N.H. 03257
TAX MAP 73 LOT 28
(FORMERLY: TAX MAP 073-026-000)

NEW LONDON BARN PLAYHOUSE, INC.
P.O. BOX 9
NEW LONDON, N.H. 03257
TAX MAP 73 LOT 27
(FORMERLY: TAX MAP 073-025-000)

DONNA L. & CYNTHIA D. SP...
P.O. BOX 132
NEW LONDON, N.H. 03257
TAX MAP 073-024-000

NEW LONDON BARN PLAYHOUSE INC.
P.O. BOX 9
NEW LONDON, N.H. 03257
TAX MAP 73 LOT 41
(FORMERLY: TAX MAP 073-042-000)
SUBJECT LOT AREA = 51,575 SQ. FT.
ZONED: INSTITUTION - THEATER ZONE

MARCIA GOULART
72 WILLIAMS DRIVE
NEW LONDON, N.H. 03257
TAX MAP 73 LOT 42
(FORMERLY: TAX MAP 073-043-000)

EGAN-MARTINSON LLC
C/O TOM MARTINSON
51 COLMBINE ROAD
MILTON, MA 02186
TAX MAP 73 LOT 59
(FORMERLY: TAX MAP 073-057-000)

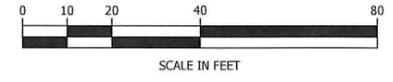
BARTON CONDOMINIUMS, LLC
C/O NIEL WEATHERS, TREASURER
P.O. BOX 280
ANDOVER, N.H. 03216
TAX MAP 73 LOT 58
(FORMERLY: TAX MAP 073-056-000)

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603-444-4111 603-877-0116 802-333-3333

NEW LONDON PLAYHOUSE,
PLAYHOUSE SITE
NEW LONDON, NEW HAMPSHIRE

NO.	DATE	REVISION DESCRIPTION

DATE	SEP	ENG	CHEK

SITE DATA
 ZONE: INSTITUTIONAL - THEATER ZONE
 EXISTING USE: THEATER
 PROPOSED USE: THEATER

DIMENSIONAL REQUIREMENTS

MINIMUM LOT DIMENSIONS	REQUIRED	PROVIDED
LOT AREA	--- SF	51,575 SF
FRONTAGE	--- FT	202.50 FT
MINIMUM SETBACK DIMENSIONS		
FRONT	25 FT	> 25 FT
SIDE	15 FT	> 15 FT
REAR	15 FT	> 15 FT
MIN. % LANDSCAPED OPEN AREA	45%	32%*

* (SEE WAIVER REQUEST FOR MIN. LANDSCAPED OPEN AREA)

PARKING SUMMARY
 REQUIRED PARKING FOR THEATRE USE:
 # OF SEATS IN THEATRE x 0.3 = 291 SEATS x 0.3
 = 88 REQUIRED PARKING SPACES

PROPOSED: 53 (INCLUDING 3 ADA; SEE WAIVER REQUEST)
 TYPICAL STALL DIMENSION: 9FT x 19FT

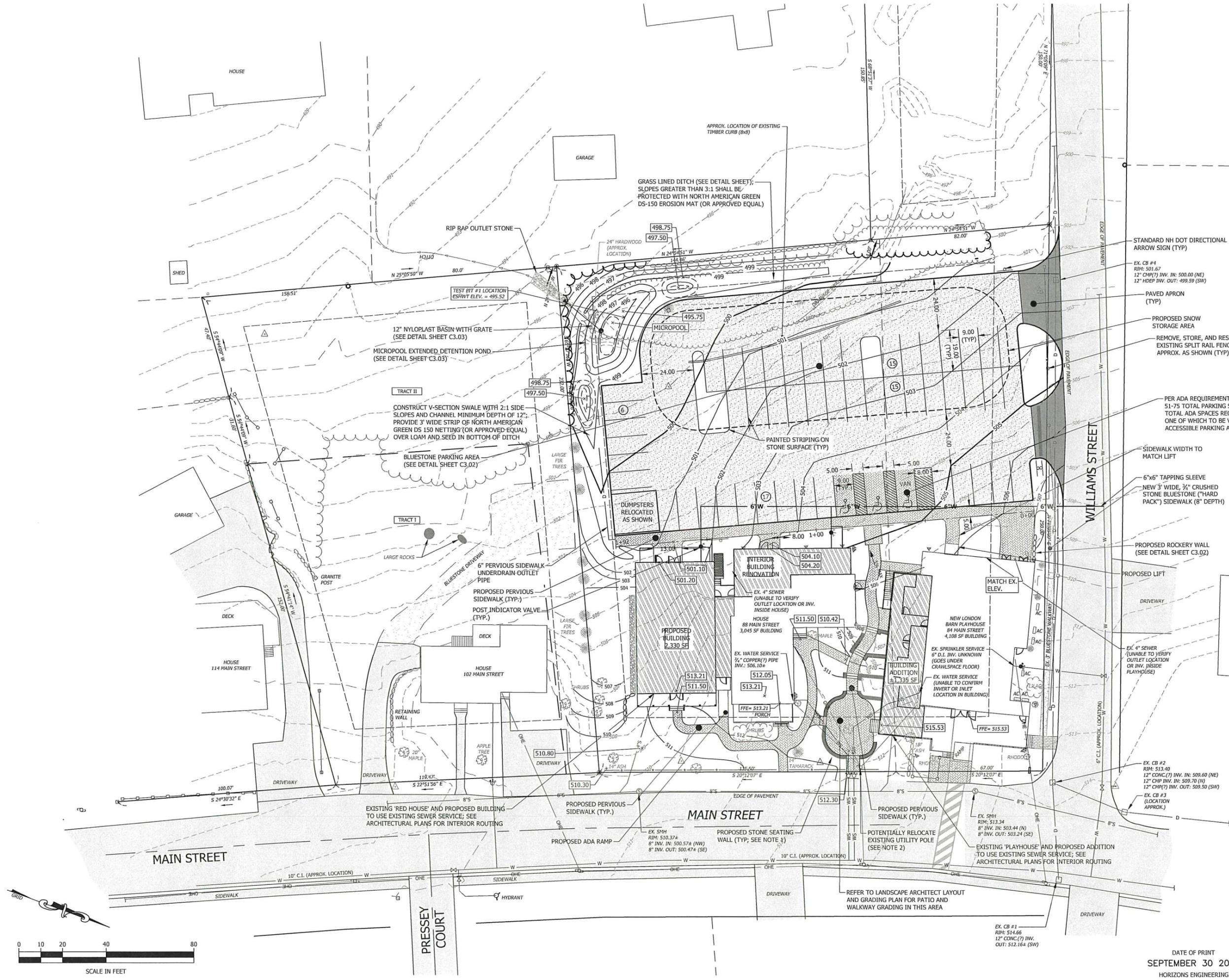
SNOW STORAGE NOTE
 NEW LONDON SITE PLAN REVIEW REGULATIONS REQUIRE STORAGE BE PROVIDED EQUAL TO 20% OF PARKING, AISLE, AND DRIVEWAY AREAS

aisle, parking, driveway : 20,566 SF
 REQUIRED SNOW STORAGE : 4,113 SF
 PROVIDED SNOW STORAGE : 8,630 SF

- NOTES**
- TEST PIT(S) REQUIRED TO VERIFY ELEVATION OF EXISTING SERVICES. MAINTAIN APPROXIMATELY 12" SEPARATION WATER SERVICE AND BOTTOM OF STONE SEATING WALL 12" DEPTH COMPACTED SAND BELOW WALL OF FOOTER CROSSING LOCATIONS.
 - OWNER TO CONTACT EVERSOURCE FOR POSSIBLE POLE TO THE NORTH

LEGEND

- STONE RETAINING WALL
- 1" IRON PIPE (FOUND) -
- GRANITE BOUND (FOUND)
- ⊙ 3/4" IRON ROT (SET) - OR
- ⊕ WATER SHUT OFF
- ⊖ WATER GATE VALVE
- CATCH BASIN
- ⊙ SEWER MANHOLE
- ▲ LIGHT
- UTILITY POLE AND NUMBER
- OHE
- OVERHEAD UTILITY LINE
- PROPERTY LINE
- ABUTTERS PROPERTY LINE
- WOODEN FENCE
- EXISTING MAJOR / MINOR
- EXISTING GRAVEL DRIVEWAY
- EXISTING PAVED AREA
- TREELINE
- DECIDUOUS TREE
- CONIFEROUS TREE



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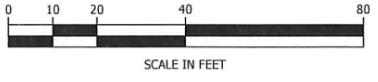
NEW LONDON PLAYHOUSE, PLAYHOUSE SITE
 NEW LONDON, NEW HAMPSHIRE

PROPOSED SITE

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SEEDING RECOMMENDATIONS

- GRADING AND SHAPING**
 - SLOPES SHALL NOT BE STEEPER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.
- SEEDBED PREPARATION**
 - SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
 - STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE AMENDED WITH ORGANIC MATTER AND TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME THOROUGHLY INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.
- ESTABLISHING VEGETATION**
 - LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:
 - AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ. FT.
 - NITROGEN (N), 50 LBS., PER ACRE OR 1.1 LBS. PER 1,000 SQ. FT.
 - PHOSPHATE (P₂O₅), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.
 - POTASH (K₂O), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.
 (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10).
 - SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.

USE	SEEDING MIXTURE (SEE 3D)	SOIL TYPE			
		DROUGHTY	WELL DRAINED	MOD. WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	GOOD	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	GOOD	FAIR

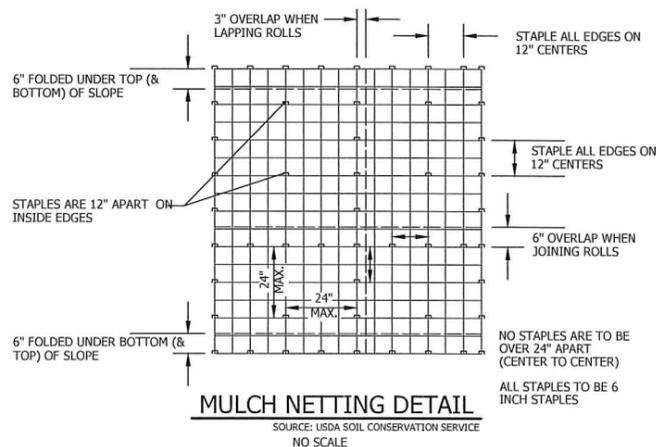
MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.
A TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
REDTOP	2	0.05
TOTAL:	42	0.95
B TALL FESCUE	15	0.35
CREeping RED FESCUE	10	0.25
CROWN VETCH OR FLATPEA	15 OR 30	0.35 OR 0.75
TOTAL:	40 OR 55	0.95 OR 1.35
C TALL FESCUE	20	0.45
FLATPEA	30	0.75
TOTAL:	50	1.20

- WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO SEPTEMBER 15. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

F. TEMPORARY SEEDING RATES:

SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.	REMARKS
WINTER RYE	112	2.5	BEST FOR FALL SEEDING. SEED FROM AUGUST TO SEPTEMBER 5TH FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	80	2.0	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15TH FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40	1.0	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE NOT IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. COVER SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30	0.7	GOOD COVER WHICH IS LONGER LASTING THAN ANNUAL RYEGRASS. SEED BETWEEN APRIL 1ST AND JUNE 1ST AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. MULCHING WILL ALLOW SEEDING THROUGHOUT THE GROWING SEASON. SEED TO A DEPTH OF APPROXIMATELY 0.5 INCH.

- MULCH**
 - HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.
 - MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING.
- MAINTENANCE TO ESTABLISH A STAND**
 - PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.
 - FERTILIZATION NEEDS SHOULD BE DETERMINED BY ON SITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.
 - IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.



EROSION CONTROL GENERAL NOTES

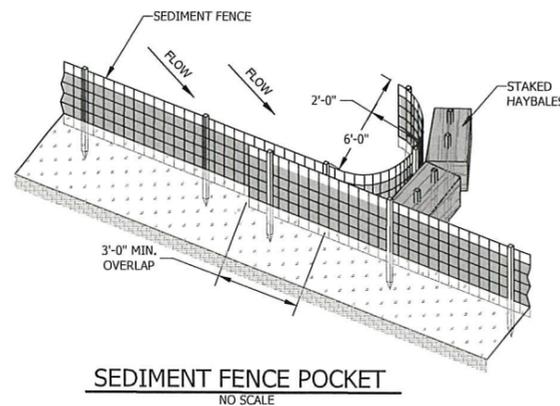
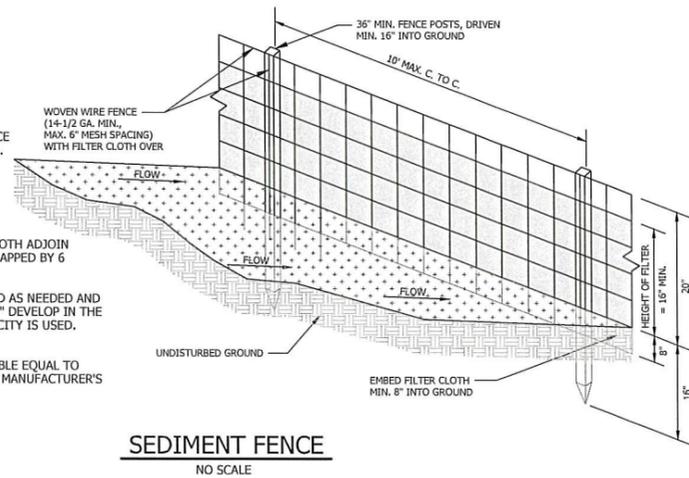
- KEEP SITE MODIFICATION TO A MINIMUM**
 - CONSIDER FITTING THE BUILDINGS AND STREETS TO THE NATURAL TOPOGRAPHY. THIS REDUCES THE NEED FOR CUTS AND FILLS. AVOID EXTENSIVE GRADING THAT WOULD ALTER DRAINAGE PATTERNS OR CREATE VERY STEEP SLOPES.
 - EXPONE AREAS OF BARE SOIL TO EROSION ELEMENTS FOR THE SHORTEST TIME POSSIBLE.
 - SAVE AND PROTECT DESIRABLE EXISTING VEGETATION WHERE POSSIBLE. ERECT BARRIERS TO PREVENT DAMAGE FROM CONSTRUCTION EQUIPMENT.
 - LIMIT THE GRADES OF SLOPES SO VEGETATION CAN BE EASILY ESTABLISHED AND MAINTAINED.
 - AVOID SUBSTANTIAL INCREASE IN RUNOFF LEAVING THE SITE.
- MINIMIZE POLLUTION OF WATER DURING CONSTRUCTION ACTIVITIES**
 - STOCKPILE TOPSOIL REMOVED FROM CONSTRUCTION AREA AND SPREAD OVER ANY DISTURBED AREAS PRIOR TO REVEGETATION. TOPSOIL STOCKPILES MUST BE PROTECTED FROM EROSION.
 - PROTECT BARE SOIL AREAS EXPOSED BY GRADING ACTIVITIES WITH TEMPORARY VEGETATION OR MULCHES.
 - USE SEDIMENT BASINS TO TRAP DEBRIS AND SEDIMENT WHICH WILL PREVENT THESE MATERIALS FROM MOVING OFF SITE.
 - USE DIVERSIONS TO DIRECT WATER AROUND THE CONSTRUCTION AREA AND AWAY FROM EROSION PRONE AREAS TO POINTS OF SAFE DISPOSAL.
 - USE TEMPORARY CULVERTS OR BRIDGES WHEN CROSSING STREAMS WITH EQUIPMENT.
 - PLACE CONSTRUCTION FACILITIES, MATERIALS, AND EQUIPMENT STORAGE AND MAINTENANCE AREAS AWAY FROM DRAINAGE WAYS.
- PROTECT AREA AFTER CONSTRUCTION**
 - ESTABLISH GRASS OR OTHER SUITABLE VEGETATION ON ALL DISTURBED AREAS. SELECT SPECIES ADAPTED TO THE SITE CONDITIONS AND THE FUTURE USE OF THE AREA. FINAL GRADES SHALL BE SEEDED WITHIN 72 HOURS. STABILIZATION SHALL BE DEFINED AS 85% VEGETATIVE COVER.
 - MAINTAIN VEGETATED AREAS USING PROPER VEGETATIVE 'BEST MANAGEMENT PRACTICES' DURING THE CONSTRUCTION PERIOD.
 - MAINTAIN NEEDED STRUCTURAL 'BEST MANAGEMENT PRACTICES' AND REMOVE SEDIMENT FROM DETENTION PONDS AND SEDIMENT BASINS AS NEEDED.
 - DETERMINE RESPONSIBILITY FOR LONG TERM MAINTENANCE OF PERMANENT 'BEST MANAGEMENT PRACTICES'.
 - IF CONSTRUCTION IS ANTICIPATED DURING WINTER MONTHS, REFER TO 'COLD WEATHER SITE STABILIZATION REQUIREMENTS'.
- INVASIVE SPECIES AND FUGITIVE DUST**
 - THE PROJECT SHALL NOT CONTRIBUTE TO THE SPREAD OF INVASIVE SPECIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EVALUATE WORK AREAS FOR THE PRESENCE OF INVASIVE SPECIES, AND IF FOUND SHALL TAKE NECESSARY MEASURES TO PREVENT THEIR SPREAD IN ACCORDANCE WITH RSA 430:51-57 AND AGR 3800. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT THE INTRODUCTION OF INVASIVE SPECIES BY INSPECTING AND CLEANING ALL EQUIPMENT ARRIVING ON SITE.
 - FUGITIVE DUST SHALL BE CONTROLLED IN ACCORDANCE WITH ENV-A 1000.

COLD WEATHER SITE STABILIZATION REQUIREMENTS

- TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE FOLLOWING ADDITIONAL STABILIZATION TECHNIQUES SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1:
- THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE LIMITED TO 1 ACRE AND SHALL BE PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPSC SPECIALIST, IS REVIEWED AND APPROVED BY NHDES.
 - ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE, SECURED WITH ANCHORED NETTING OR TACKIFIER, OR 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
 - ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF GREATER THAN 15% WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH PROPERLY INSTALLED AND ANCHORED EROSION CONTROL MATTING OR WITH A MINIMUM 4 INCH THICKNESS OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H).
 - INSTALLATION OF ANCHORED HAY MULCH OR EROSION CONTROL MIX, MEETING THE CRITERIA OF ENV-WQ 1506.05(D) THROUGH (H), SHALL NOT OCCUR OVER SNOW OF GREATER THAN 1 INCH IN DEPTH.
 - INSTALLATION OF EROSION CONTROL MATTING SHALL NOT OCCUR OVER SNOW OF GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
 - ALL PROPOSED STABILIZATION IN ACCORDANCE WITH NOTES 2 OR 3 ABOVE, SHALL BE COMPLETED WITHIN 1 DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
 - ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.
 - AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3 INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM NO. 304.1 OR 304.2.

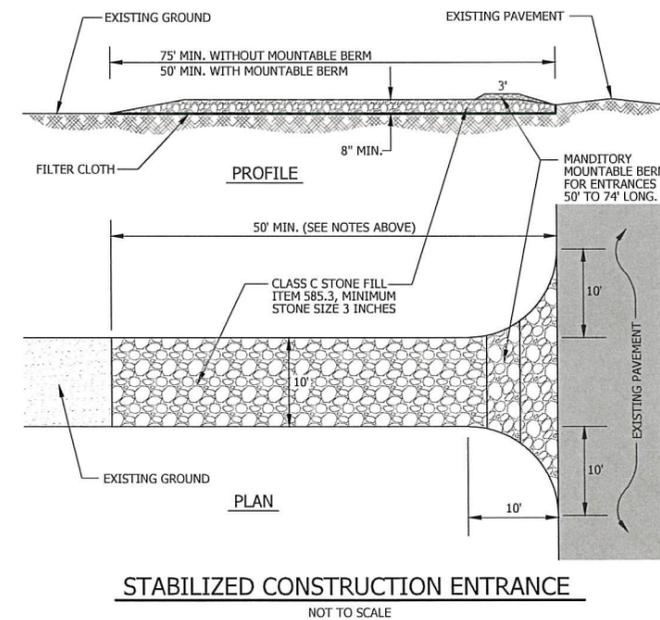
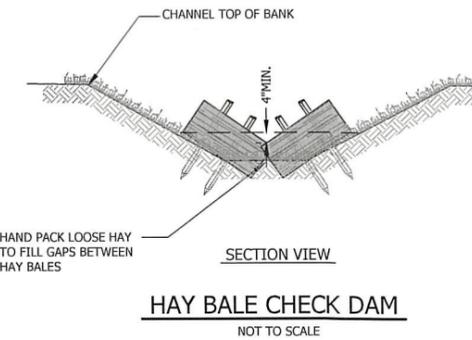
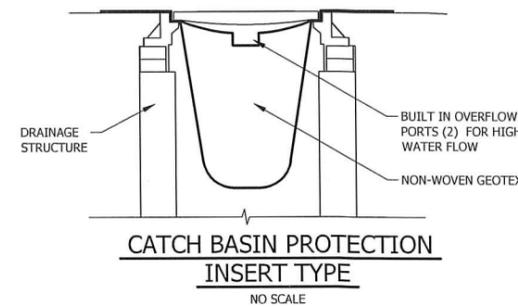
CONSTRUCTION NOTES FOR SEDIMENT FENCE

- WOVEN WIRE FENCE, IF REQUIRED, TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
- FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP, MID SECTION, AND BOTTOM.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN 'BULGES' DEVELOP IN THE SEDIMENT FENCE, OR 50% OF CAPACITY IS USED.
- 12" DIAMETER FILTREXX SILT/SOXX SHALL BE CONSIDERED AN ACCEPTABLE EQUAL TO SEDIMENT FENCE IF INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.



CONSTRUCTION SEQUENCE

- PREPARE AN EROSION CONTROL PLAN OR A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REQUIREMENTS.
- INSTALL CONSTRUCTION ENTRANCE, SEE DETAIL.
- CUT AND CLEAR TREES WITHIN THE CLEARING LIMITS.
- INSTALL SEDIMENT FENCES, ROCK CHECK DAMS, AND OTHER APPROPRIATE EROSION CONTROL MEASURES AT LOCATIONS SHOWN ON THE PLANS AND AS NEEDED.
- GRUB SITE WITHIN GRADING LIMITS.
- STRIP AND STOCKPILE TOPSOIL AND INSTALL EROSION CONTROL MEASURES.
- INSTALL/ADJUST SEDIMENT FENCE, CHECK DAMS, AND HAYBALES, AS REQUIRED.
- CONSTRUCT PERMANENT STORMWATER CONTROLS AS SOON AS PRACTICAL. DO NOT DIRECT STORMWATER TOWARD TREATMENT BASINS, PONDS, SWALES, DITCHES AND LEVEL SPREADERS UNTIL THEY HAVE BEEN STABILIZED.
- PROCEED WITH WORK, LIMITING THE DURATION OF DISTURBANCE. THE MAXIMUM OF UNCOVERED DISTURBED EARTH AT ANY ONE TIME IS FIVE ACRES. THE MAXIMUM LENGTH OF TIME THAT DISTURBED EARTH MAY BE LEFT UNSTABILIZED IS 45 DAYS.
- BEGIN SEEDING AND MULCHING IMMEDIATELY AFTER GRADING. ALL DISTURBED AREAS SHALL BE STABILIZED WITH APPROVED METHODS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
 - AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
 - A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED; OR
 - EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- INSPECT ALL EROSION CONTROL MEASURES ON A DAILY BASIS AND AFTER EVERY 0.5 INCHES OF PRECIPITATION. MAINTAIN SEDIMENT FENCE, SEDIMENT TRAPS, HAY BALES, ETC., AS NECESSARY.
- PAVE ROADWAYS AND/OR PARKING AREAS.
- PLACE TOPSOIL, SEED AND MULCH.
- COMPLETE ALL REMAINING PERMANENT EROSION CONTROL STRUCTURES.
- MONITOR THE SITE AND MAINTAIN STRUCTURES AS NEEDED UNTIL FULL VEGETATION IS ESTABLISHED.



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NEW LONDON
PLAYHOUSE,
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EROSION CONTROL
AND DETAIL

NO. DATE REVISION DESCRIPTION

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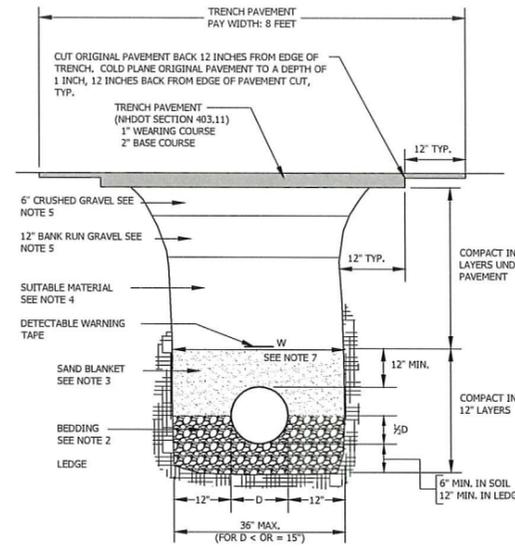
SEWER NOTES

- GENERAL**
CONSTRUCTION OF ALL COMPONENTS OF THE SANITARY SEWER SYSTEM SHALL CONFORM TO THE MOST CURRENT VERSION OF THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES ENV-WQ 700 AND TECHNICAL SPECIFICATIONS ENTITLED "SEWER SYSTEMS".
- TYPES OF SEWERS**
A. THERE SHALL BE NO CONNECTION BETWEEN SANITARY SEWERS AND STORM SEWERS.
B. RUNOFF FROM ROOFS, STREETS, AND OTHER AREAS AND GROUNDWATER FROM FOUNDATION DRAINS, SUMP PUMPS, OR OTHER SUBSURFACE DRAINS SHALL BE EXCLUDED FROM SANITARY SEWERS.
- SEWER SIZE AND COVER**
A. MINIMUM PIPE SIZE FOR GRAVITY SEWER MAINS SHALL BE 8 INCHES.
B. MINIMUM PIPE SIZE FOR GRAVITY SEWER SERVICES SHALL BE 4 INCHES.
C. MINIMUM PIPE SIZE FOR FORCE MAIN SEWER SERVICES SHALL BE 2 INCHES.
D. SANITARY SEWERS SHALL HAVE 6 FEET MINIMUM COVER IN ALL ROADWAY LOCATIONS AND 4 FEET MINIMUM COVER IN ALL CROSS-COUNTRY LOCATIONS.
- PIPE AND FITTING MATERIALS:**
A. **DUCTILE IRON PIPE**
DUCTILE IRON PIPE AND FITTINGS SHALL CONFORM TO THE FOLLOWING STANDARDS OF THE AMERICAN WATER WORKS ASSOCIATION:
(1) AWWA C151 FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST IN METAL OR SAND LINED MOLDS, FOR WATER OR OTHER LIQUIDS;
(2) AWWA C150 FOR THICKNESS DESIGN OF DUCTILE IRON PIPE AND WITH ASTM A 536 IRON CASTINGS; AND
(3) JOINTS SHALL BE MECHANICAL TYPE, PUSH-ON TYPE, OR BALL-AND-SOCKET TYPE;
B. **PVC (POLY VINYL CHLORIDE) PIPE**
PVC PIPE AND FITTINGS SHALL BE APPROVED FOR SEWAGE SERVICE AND CONFORM TO THE FOLLOWING:
(1) PVC PIPE USED FOR GRAVITY SEWERS SHALL BE TYPE SDR 35 CONFORMING TO ASTM D3034;
(2) PVC PIPE USED FOR FORCE MAINS SHALL BE TYPE SDR 26 CONFORMING TO ASTM D2241 OR ASTM D1785;
(3) JOINTS SHALL BE PUSH-ON, BELL-AND-SPIGOT TYPE HAVING OIL RESISTANT COMPRESSION RINGS OF ELASTOMERIC MATERIAL CONFORMING TO ASTM D3212.
- BEDDING**
PIPE BEDDING SHALL BE SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM ORGANIC MATTER, CLAY, AND/OR LOAM MEETING ASTM C33 STONE SIZE NO. 67. BEDDING SHALL EXTEND FROM THE SPRING LINE OF THE PIPE TO A MINIMUM DEPTH OF 6" BELOW THE BOTTOM OF THE PIPE OUTSIDE SURFACE.

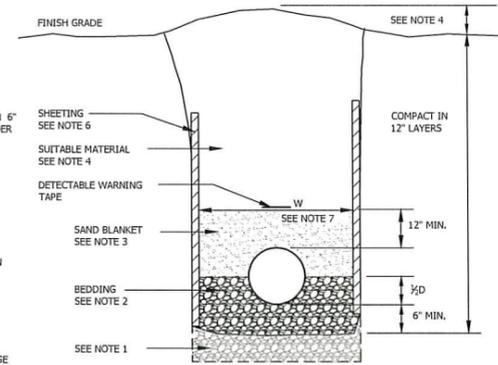
100% PASSING	1 INCH SCREEN
90-100% PASSING	3/4 INCH SCREEN
20-55% PASSING	3/8 INCH SCREEN
0-10% PASSING	#4 SIEVE
0-5% PASSING	#8 SIEVE
- MANHOLES**
A. PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478.
B. MANHOLES SHALL BE DESIGNED FOR H-20 LOADING.
C. HORIZONTAL JOINTS BETWEEN BARREL SECTIONS SHALL BE OF AN OVERLAPPING TYPE WHICH SHALL DEPEND UPON A DOUBLE ROW OF ELASTOMERIC OR MASTIC-LIKE SEALANT FOR WATER TIGHTNESS.
D. PIPE TO MANHOLE JOINTS SHALL BE AS FOLLOWS:
(1) ELASTOMERIC, RUBBER SLEEVE WITH WATERTIGHT JOINTS AT THE MANHOLE OPENING AND PIPE SURFACES;
(2) CAST INTO THE WALL OR SECURED WITH STAINLESS STEEL CLAMPS;
(3) ELASTOMERIC SEALING RING CAST IN THE MANHOLE OPENING WITH SEAL FORMED ON THE SURFACE OF THE PIPE BY COMPRESSION OF THE RING; AND
(4) NON-SHRINK GROUTED JOINTS WHERE WATERTIGHT BONDING TO THE MANHOLE AND PIPE CAN BE OBTAINED.
E. MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE PLACED AFTER TESTING.
- PROTECTION OF WATER SUPPLIES**
A. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE WATER SUPPLY SYSTEM AND A SEWER OR SEWER APPURTENANCE WHICH WOULD PERMIT THE PASSAGE OF SEWAGE OR POLLUTED WATER INTO THE POTABLE SUPPLY. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SEWER OR SEWER MANHOLE.
B. NO SEWER SHALL BE LOCATED WITHIN THE WELL PROTECTIVE RADII ESTABLISHED IN ENV-W3 300 FOR ANY PUBLIC WATER SUPPLY WELLS OR WITHIN 100 FEET OF ANY PRIVATE WATER SUPPLY WELL.
C. SEWERS SHALL BE LOCATED AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN.
D. A DEVIATION FROM THE SEPARATION REQUIREMENTS OF (B) OR (C) ABOVE SHALL BE ALLOWED WHERE NECESSARY TO AVOID CONFLICT WITH SUBSURFACE STRUCTURES, UTILITY CHAMBERS, AND BUILDING FOUNDATIONS, PROVIDED THAT THE SEWER IS CONSTRUCTED IN ACCORDANCE WITH THE FORCE MAIN CONSTRUCTION REQUIREMENTS SPECIFIED IN ENV-WQ 704.06.
E. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
(1) VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER; AND
(2) SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.

STANDARD TRENCH NOTES - SEWER & WATER

- ORDERED EXCAVATION OF UNSUITABLE MATERIAL** BELOW GRADE SHALL BE REPLACED WITH BEDDING MATERIAL. SEE ALSO NOTE 4.
- BEDDING:** SCREENED GRAVEL AND/OR CRUSHED STONE FREE FROM ORGANIC MATTER, CLAY, AND/OR LOAM MEETING ASTM C33 STONE SIZE NO. 67.
- SAND BLANKET:** CLEAN SAND FREE FROM ORGANIC MATTER, SO GRADED THAT 100% PASSES A 1/2 INCH SIEVE AND NOT MORE THAN 15% PASSES A #200 SIEVE.
- SUITABLE MATERIAL:** IN ROADS, ROAD SHOULDERS, WALKWAYS, AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED FROM THE TRENCH DURING THE COURSE OF CONSTRUCTION, AFTER EXCLUDING DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER SIX INCHES IN LARGEST DIMENSION, OR ANY MATERIAL NOT APPROVED BY THE ENGINEER.
TRENCH BACKFILL IN CROSS-COUNTRY LOCATIONS SHALL BE SUITABLE MATERIAL AS DESCRIBED ABOVE, EXCEPT THAT TOP SOIL, LOAM, MUCK, OR PEAT MAY BE USED PROVIDED THAT THE COMPLETED CONSTRUCTION WILL BE STABLE AND ACCESS TO THE PIPE FOR MAINTENANCE AND RECONSTRUCTION IS PRESERVED. BACKFILL SHALL BE MOUND TO A HEIGHT OF SIX INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- BASE COURSE FOR TRENCH REPAIR** SHALL MEET THE REQUIREMENTS OF SECTION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.
- SHEETING:** ALL TRENCH SUPPORTS SHALL CONFORM TO OSHA STANDARDS. CONTRACTOR IS RESPONSIBLE FOR OSHA COMPLIANCE AND WORKER SAFETY THROUGHOUT CONSTRUCTION.
- TRENCH DIMENSIONS:** W = MAXIMUM ALLOWABLE TRENCH WIDTH MEASURED 12 INCHES ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER (D) OR LESS, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL BE 24 INCHES PLUS THE PIPE OUTSIDE DIAMETER. W SHALL ALSO BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE. THE MAXIMUM ALLOWABLE TRENCH PAVEMENT PAYMENT WIDTH SHALL BE 8 FEET CENTERED OVER PIPE.
- PIPE INSULATION AT STORM DRAIN CROSSING:** INSTALL 2" THICK RIGID FOAM INSULATION OVER SEWER AT STORM DRAIN CROSSINGS, EXTEND INSULATION 4 FEET EITHER SIDE OF STORM DRAIN ALONG SEWER.



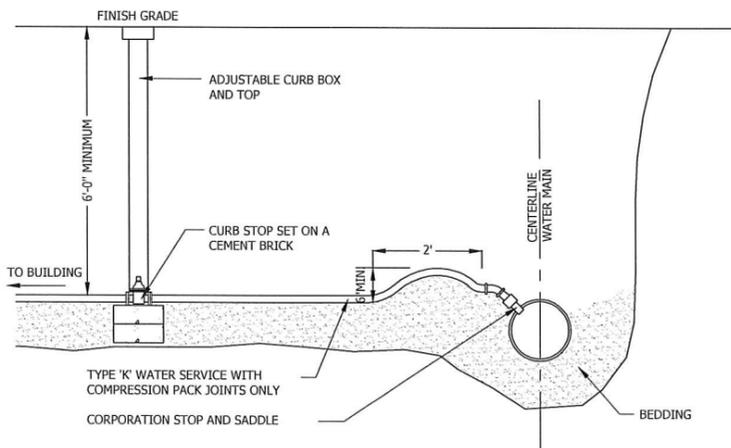
LEDGE/SUB PAVEMENT CONSTRUCTION



EARTH CONSTRUCTION WITH OR WITHOUT SHEETING

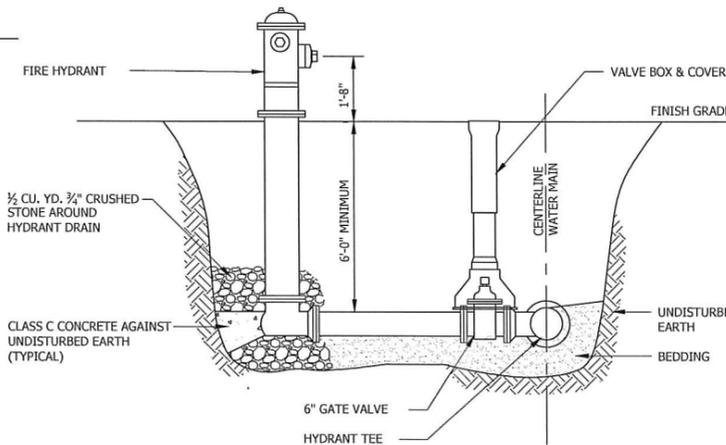
STANDARD TRENCH SECTIONS

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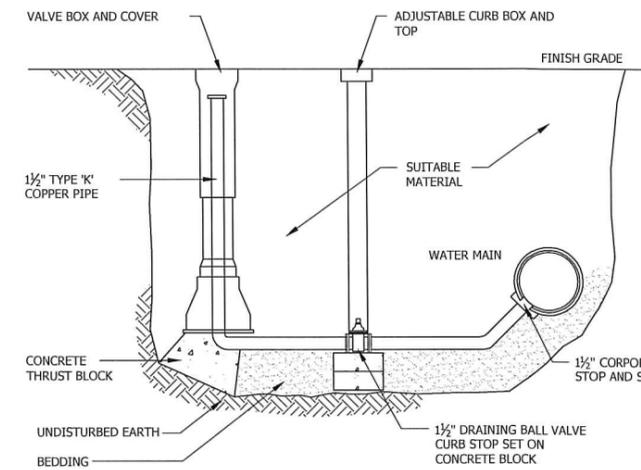
WATER SERVICE CONNECTION

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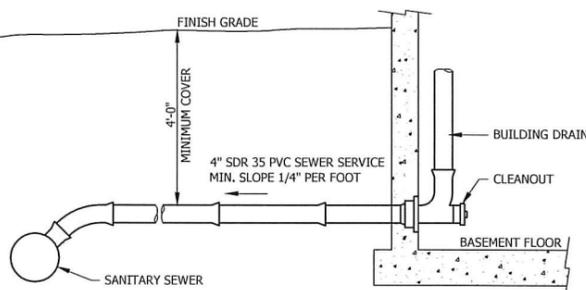
FIRE HYDRANT DETAIL

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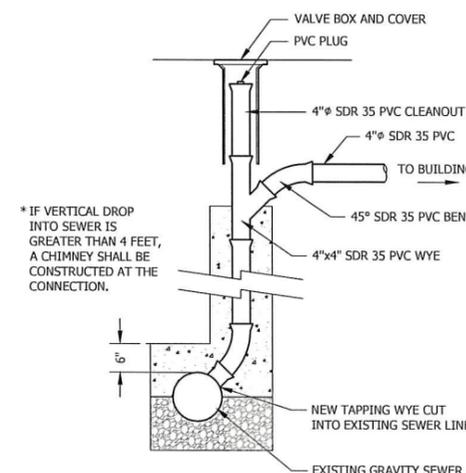
BLOWOFF DETAIL

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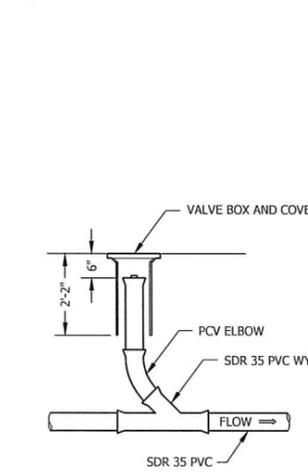
SEWER SERVICE DETAIL

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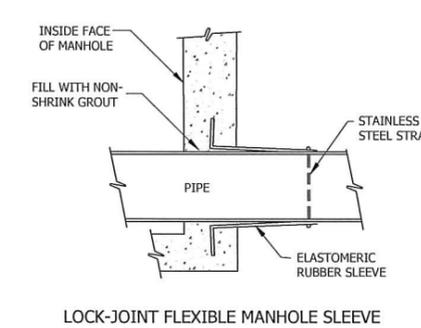
CHIMNEY AT NEW SEWER CONNECTION

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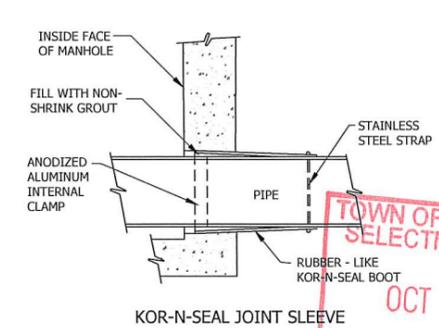


SEWER CLEANOUT DETAIL

NOT TO SCALE



LOCK-JOINT FLEXIBLE MANHOLE SLEEVE



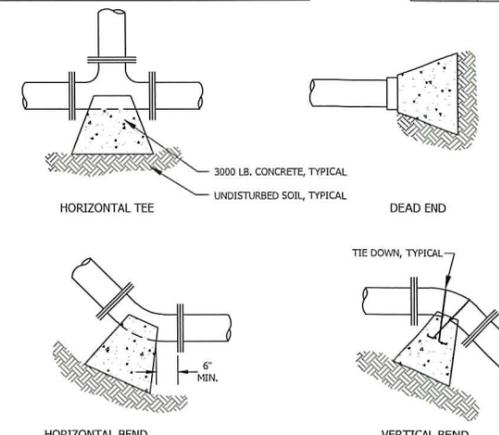
KOR-N-SEAL JOINT SLEEVE

JOINTING DETAILS

NOT TO SCALE

NOTE:
- BLOCKS MUST BE POURED AGAINST UNDISTURBED SOIL.
- THE PIPE JOINT AND BOLTS MUST BE ACCESSIBLE.
- CONCRETE SHOULD BE CURED FOR AT LEAST 5 DAYS AND SHOULD HAVE A COMPRESSION STRENGTH OF 3,000 LBS. AT 28 DAYS.
- BLOCKS MUST BE POSITIONED TO COUNTERACT THE DIRECTION OF THE RESULTANT THRUST FORCE.
RESTRAINED JOINTS MAY BE USED FOR RESISTING THRUST FORCES WHERE THERE IS A SHORTAGE OF SPACE OR WHERE THE SOIL BEHIND A FITTING WILL NOT PROVIDE ADEQUATE SUPPORT. THIS RESTRAINING METHOD INVOLVES PLACEMENT OF THESE SPECIAL JOINTS AT APPROPRIATE FITTINGS AND FOR A PREDETERMINED NUMBER OF PIPE LENGTHS ON EACH SIDE, (MINIMUM 15 FEET).

NOMINAL PIPE DIA. (INCHES)	TOTAL THRUST (POUNDS)				
	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	355
4	1,810	2,559	1,385	706	355
6	3,739	5,288	2,862	1,459	733
8	6,433	9,097	4,923	2,510	1,261
10	9,877	13,885	7,406	3,776	1,897
12	13,665	19,353	10,474	5,340	2,683
14	18,385	26,001	14,072	7,174	3,604
16	23,779	33,628	18,199	9,278	4,661
18	29,865	42,235	22,858	11,653	5,855
20	36,644	51,822	28,046	14,298	7,183
24	52,279	73,924	40,013	20,398	10,249



THRUST BLOCK NOTES & DETAILS

NOT TO SCALE

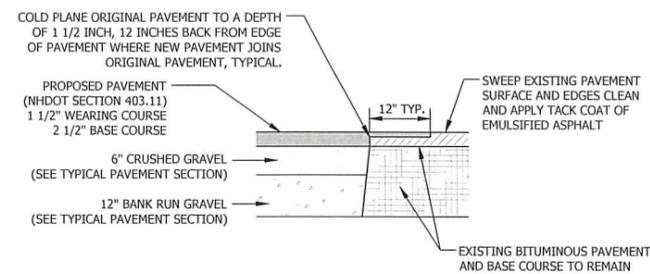
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STANDARD SANITARY WATER SYSTEM NOTES

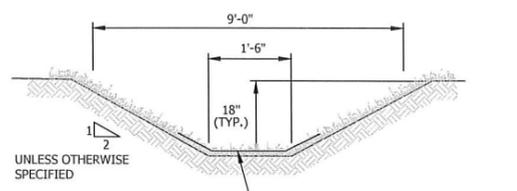
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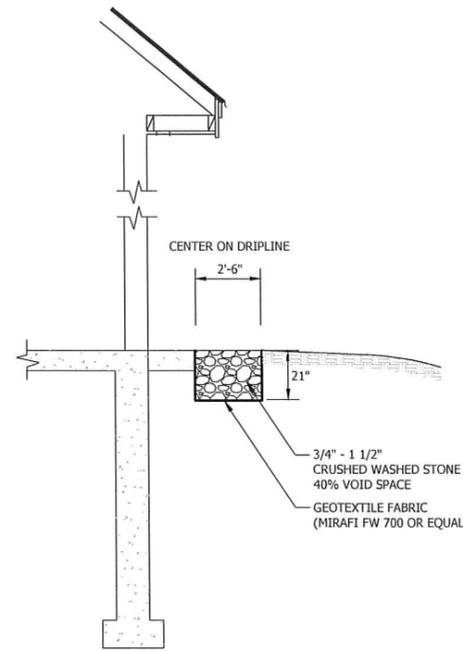
PAVEMENT JOINING DETAIL

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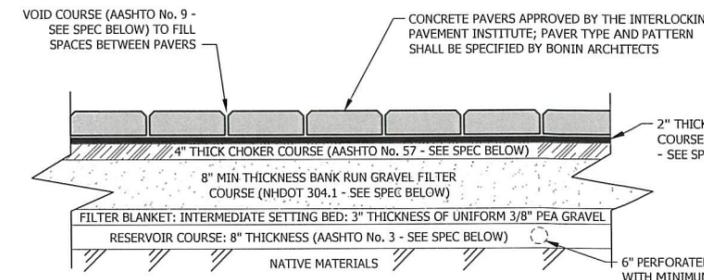
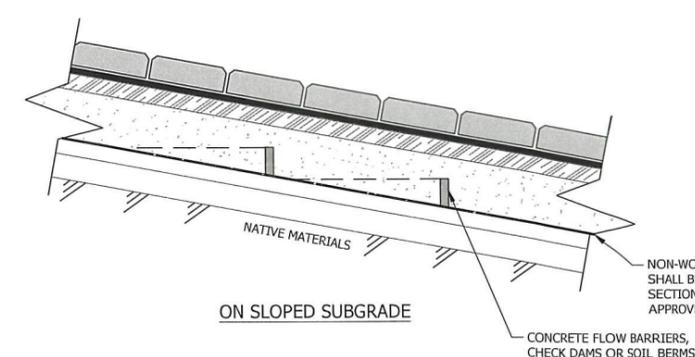
GRASS LINED DITCH DETAIL

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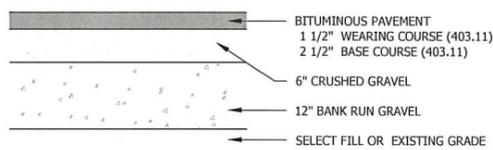
STONE DRIP EDGE DETAIL

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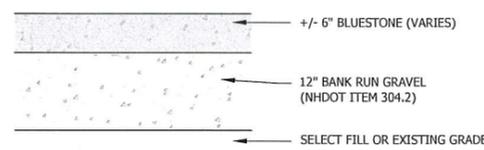
TYPICAL PATIO SECTION - PERVIOUS PAVERS

NOT TO SCALE



TYPICAL PAVEMENT SECTION

NOT TO SCALE



TYPICAL BLUESTONE PARKING LOT SECTION

NOT TO SCALE

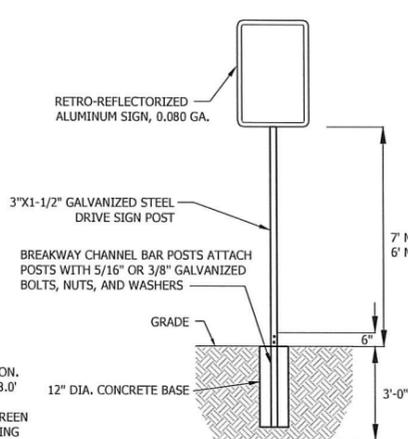
U.S. STANDARD SIEVE SIZE	PERCENT PASSING (%)					
	VOID COURSE (ASTM No. 9)	BEDDING COURSE (ASTM No. 8)	CHOKER COURSE (AASHTO No. 57)	FILTER COURSE (NHDOT 304.1)	RESERVOIR COURSE (AASHTO No. 3)	RESERVOIR COURSE ALT. (AASHTO No. 5)
6" (150mm)	-	-	-	100	-	-
2 1/2" (63mm)	-	-	-	100	100	-
2" (50mm)	-	-	-	95-100	90-100	-
1 1/2" (37.5mm)	-	-	100	35-70	35-70	100
1" (25mm)	-	-	95-100	0-15	0-15	90-100
3/4" (19mm)	-	-	25-60	-	20-55	-
1/2" (12.5mm)	-	100	-	0-5	0-10	0-10
3/8" (9.5mm)	100	85 TO 100	-	-	0-5	0-5
#4 (4.75mm)	85 TO 100	10 TO 30	0-10	75-100	-	-
#8 (2.36mm)	10 TO 40	0 TO 10	0-5	0-12	-	-
#16 (1.18mm)	0 TO 10	-	-	-	-	-
#50 (0.30mm)	0 TO 5	-	-	-	-	-

*ALTERNATE GRADATION (e.g. AASHTO No. 5) FOR RESERVOIR COURSE MAY BE ACCEPTED WITH ENGINEER'S APPROVAL.

NOTE:

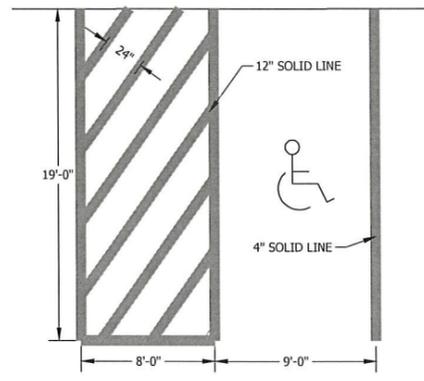
THE CONTRACTOR AND OWNER ARE ADVISED TO REFERENCE THE "UNHSC DESIGN SPECIFICATIONS FOR POROUS ASPHALT PAVEMENT AND INFILTRATION BEDS" FOR CONSTRUCTION AND MAINTENANCE OF THE PAVEMENT SECTION.

SIGN SUMMARY			
M.U.T.C.D. NUMBER	SPECIFICATION WIDTH	HEIGHT	DESC.
R7-8	12"	18"	RESERVED PARKING
R7-8B	12"	6"	VAN ACCESSIBLE
R6-2	12"	18"	ONE WAY



SIGNAGE DETAIL

NOT TO SCALE

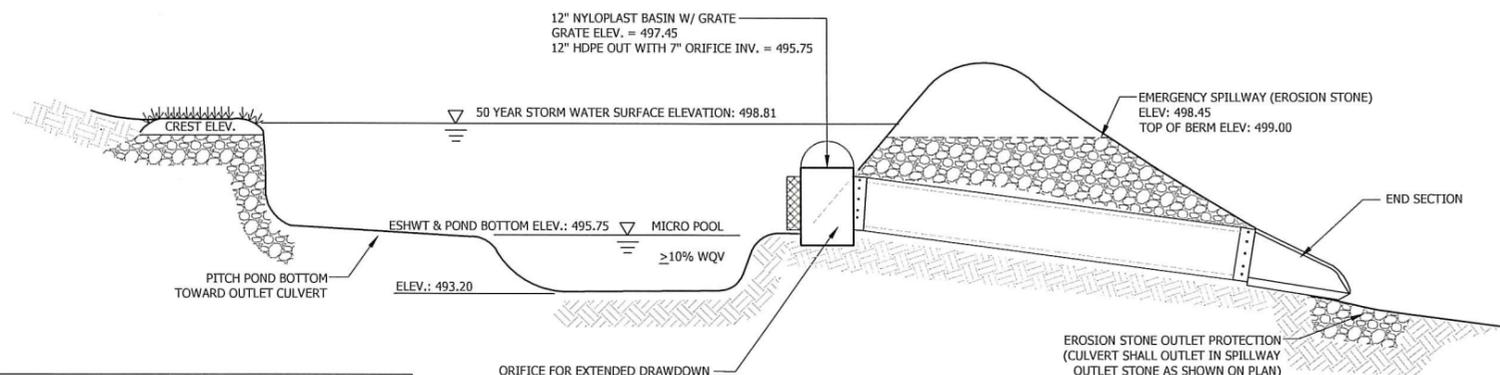


ADA ACCESSIBLE PARKING DETAIL

NOT TO SCALE

ADA SPECIFIC NOTES:

- (1) SIGN AT EACH HANDICAP SPACE. SEE SITE PLAN FOR LOCATION. PROVIDE "VAN ACCESSIBLE" SIGNAGE AT SPACES ADJACENT TO 8.0' LOADING AREA.
- SIGNS SHALL COMPLY WITH ADA AND M.U.T.C.D. STANDARDS. GREEN BORDER AND LETTERING ON WHITE BACKGROUND AND EXHIBITING INTERNATIONAL SYMBOL OF ACCESSIBILITY.



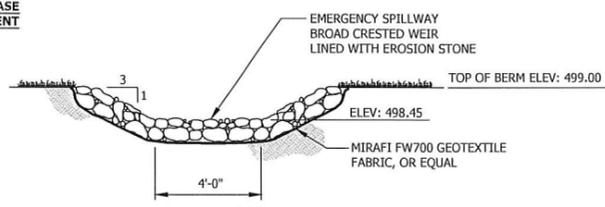
MICROPOOL EXTENDED DETENTION POND SEEDING RATES:

SPECIES	TOTAL IN %	POUNDS PER ACRE
OBL BAILLEYS SEDGE	10%	5
TUSsock SEDGE	10%	5
BLUEFLAG IRIS	10%	2.5
CANADA RUSH	5%	2.5
PICKERAL WEED	2 LBS	1
FACW WOOL GRASS	10%	5
FAC OHIO SPIDER WORT	5%	4
CONSERVATION MIX	50%	25
		50

* SEEDING MIX AVAILABLE FROM "ERNST SEEDS", MEADVILLE, PA, 800-873-3321 OR EQUAL

NOTE: SEE LANDSCAPING PLAN FOR PROPOSED PLANTINGS

ORIFICE FOR EXTENDED DRAWDOWN WITH DEBRIS CAGE OR SCREEN AROUND END SECTION
SEE ORIFICE DETAIL - NOTE PHASE 1 AND PHASE 2 ARE DIFFERENT

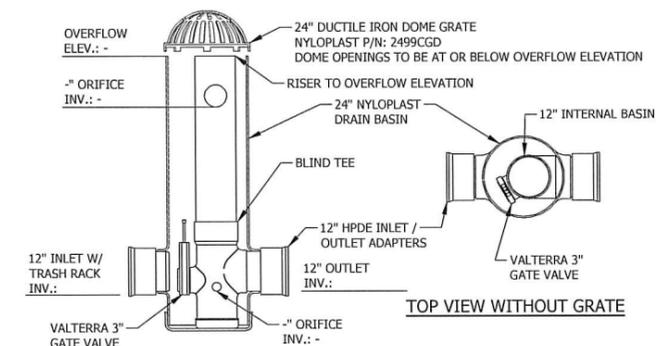


EMERGENCY SPILLWAY DETAIL

NOT TO SCALE

MICROPOOL EXTENDED DETENTION POND

NOT TO SCALE



- REMOVABLE STAND PIPE AND OUTLET SIZE ARE RESTRICTED BY FLOW CONTROL STRUCTURE SIZE.
- FLOW CONTROL STRUCTURE TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.
- DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER.
- ORIFICES TO BE CORED BY NYLOPLAST, BASED ON SHOP DRAWINGS PROVIDED BY THE CONTRACTOR
- TRASH RACK ON 12" INLET TO BE FABRICATED BY NYLOPLAST. MAXIMUM HOLE SIZE = 0.75 INCH. MINIMUM TOTAL OPENING AREA = 26.5 INCH².

NOTE:
DETAIL MODIFIED FROM NYLOPLAST DWG NUMBER 7008-110-008, AND IS COPYRIGHTED BY NYLOPLAST, 3130 VERONA LANE, BUFORD, GA 30518; (770) 932-2443.

NYLOPLAST WATER CONTROL STRUCTURE

NOT TO SCALE

DATE OF PRINT
SEPTEMBER 30 2019
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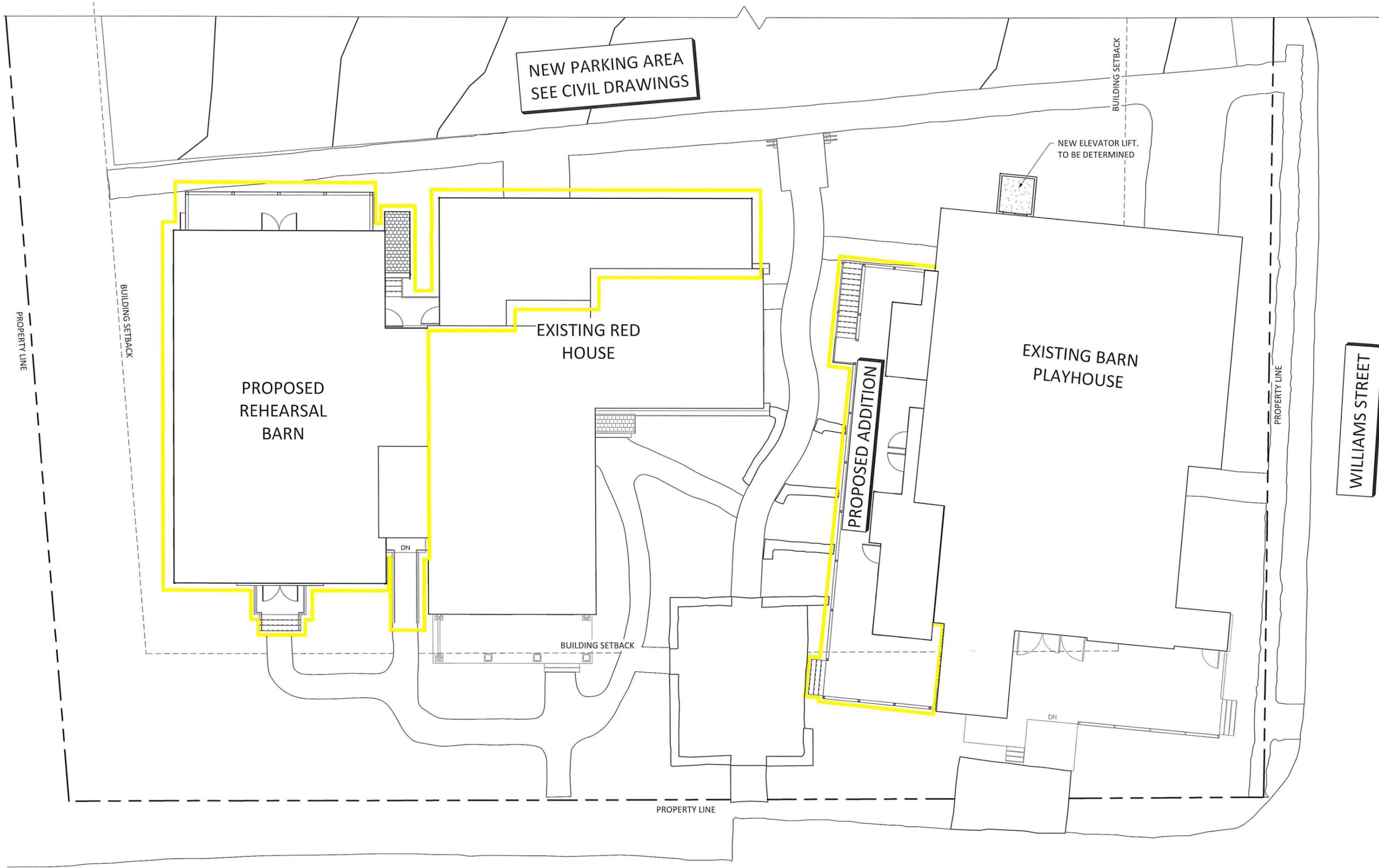
horizon
Engineers
Littleton NH • New London NH • Newport
603-444-4111 603-877-0116 802-333-3333

NEW LONDON PLAYHOUSE, PLAYHOUSE SITE
NEW LONDON, NEW HAMPSHIRE

MISCELLANEOUS D

NO.	DATE	REVISION	DESCRIPTION

TOWN OF NEW LONDON
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1 PROPOSED GROUND LEVEL
SCALE: 1/8" = 1'-0"

MAIN STREET

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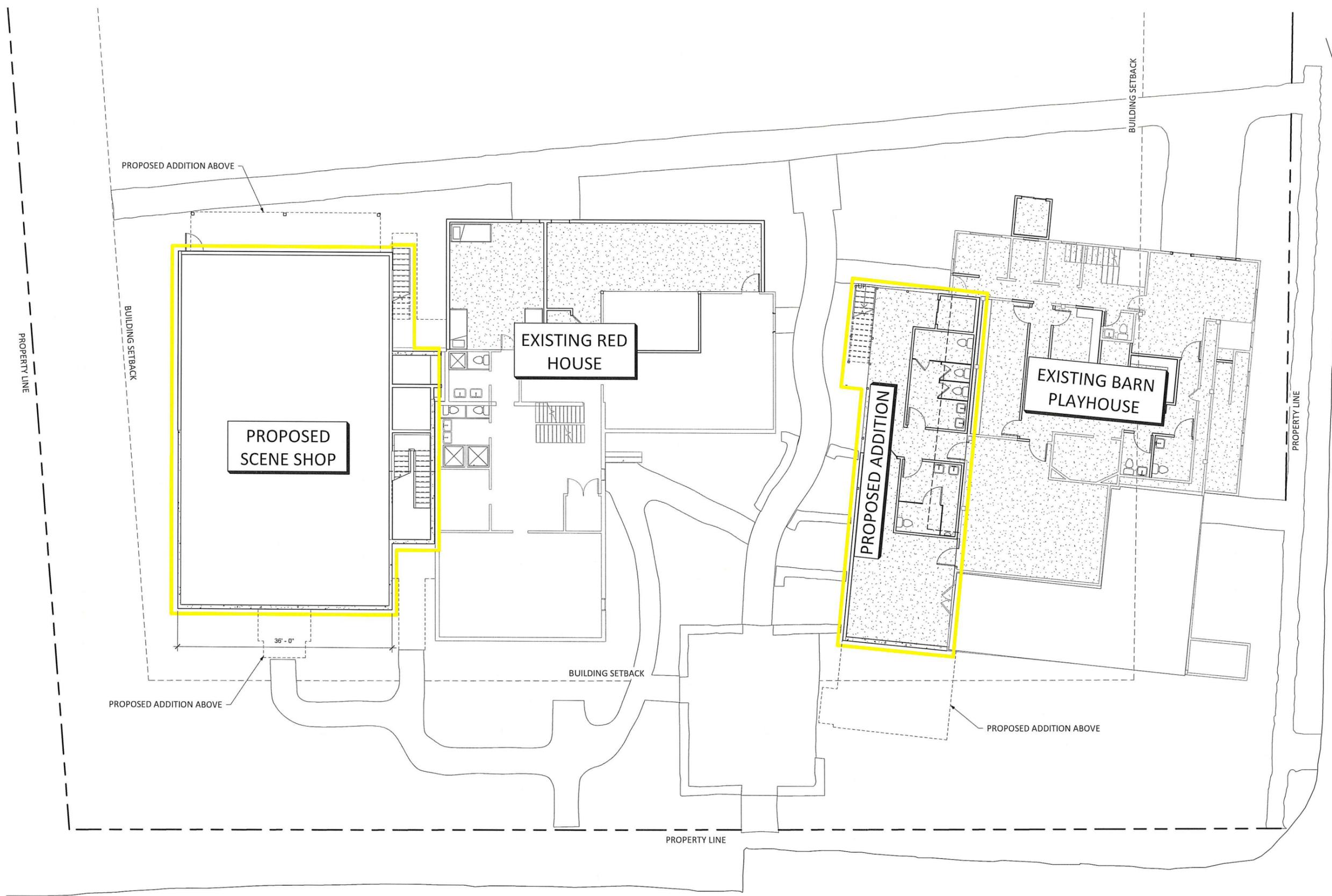
Frank Anzalone Associates
Architects and Planners

GENERAL NOTES
THESE PLANS ARE AN INSTRUMENT OF SERVICE AND ARE THE PROPERTY OF THE ARCHITECT. INFRINGEMENTS WILL BE PROSECUTED.
ISSUED FOR:
SITE PLAN APPROVAL

NEW LONDON BARN
PLAYHOUSE, INC.

BARN PLAYHOUSE
PROPOSED

Project Number:
Date:
Scale:
Sheet:
A-1



1 PROPOSED LOWER LEVEL
SCALE: 1/8" = 1'-0"

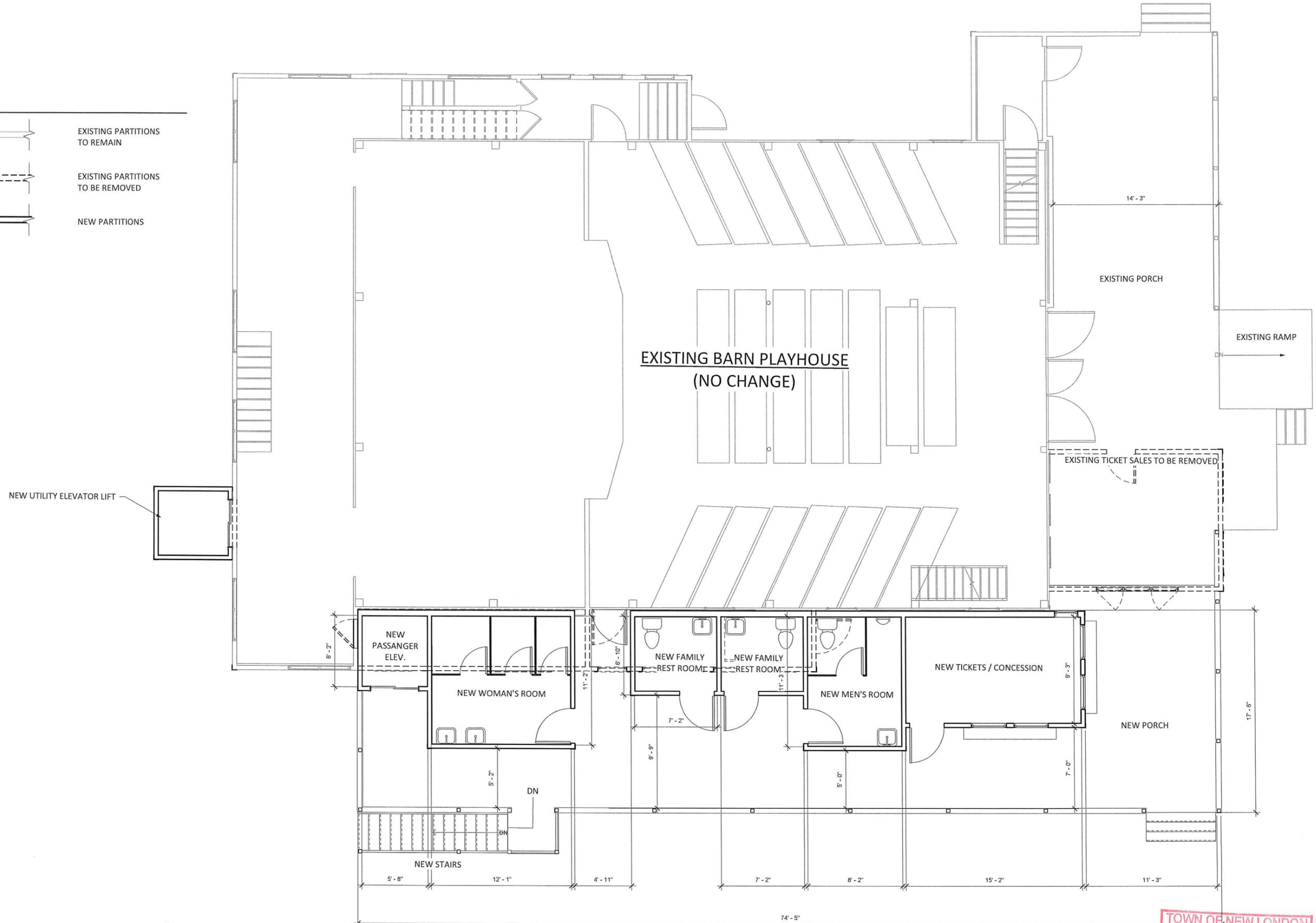
MAIN STREET

WILLIAMS STREET

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LEGEND

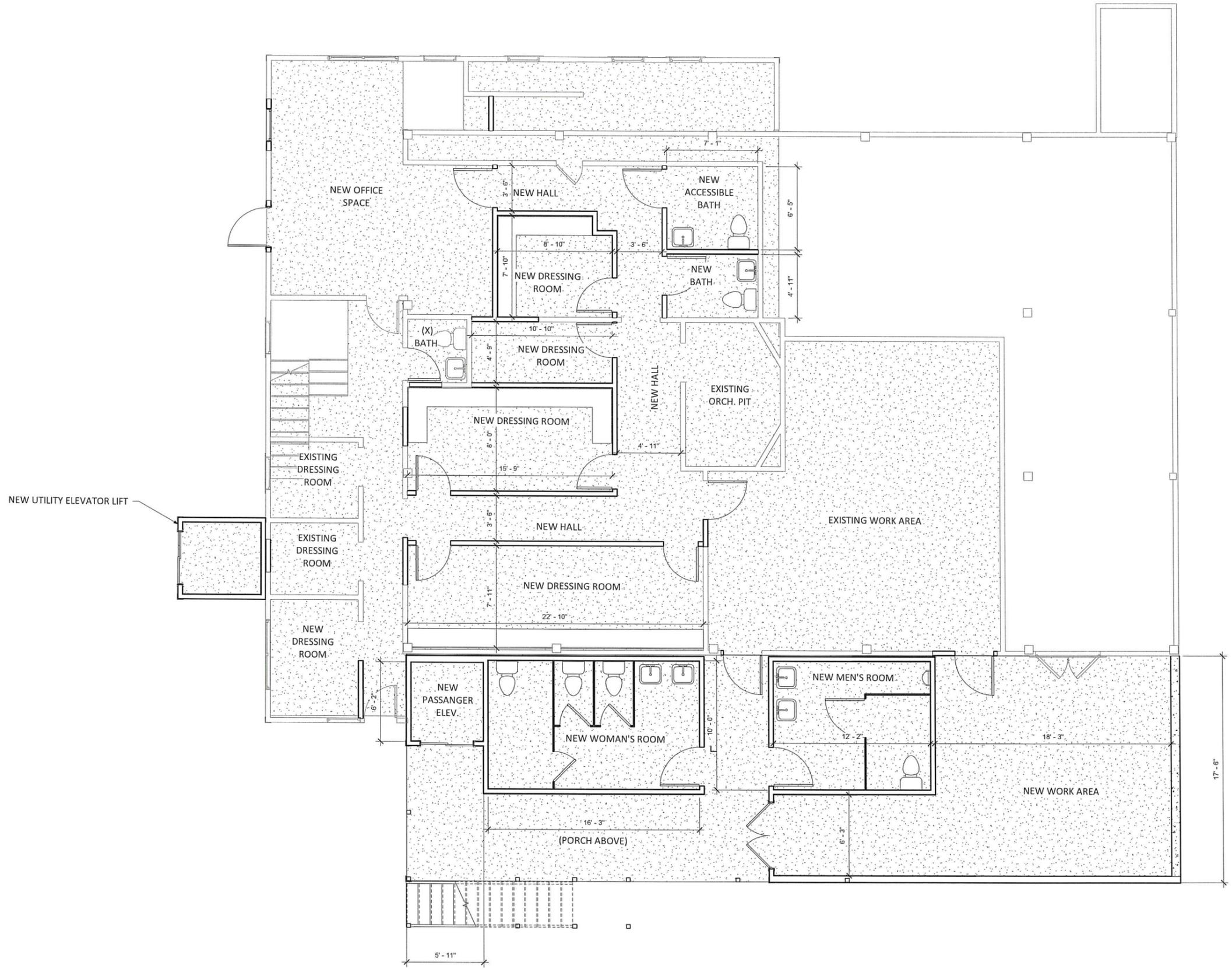
-  EXISTING PARTITIONS TO REMAIN
-  EXISTING PARTITIONS TO BE REMOVED
-  NEW PARTITIONS



1 BARN PLAYHOUSE MAIN FLOOR PLAN
SCALE: 1/4" = 1'-0"

EXISTING PORCH AREA = 578 Sq. Ft.
PROPOSED PORCH AREA = 1089 Sq. Ft.





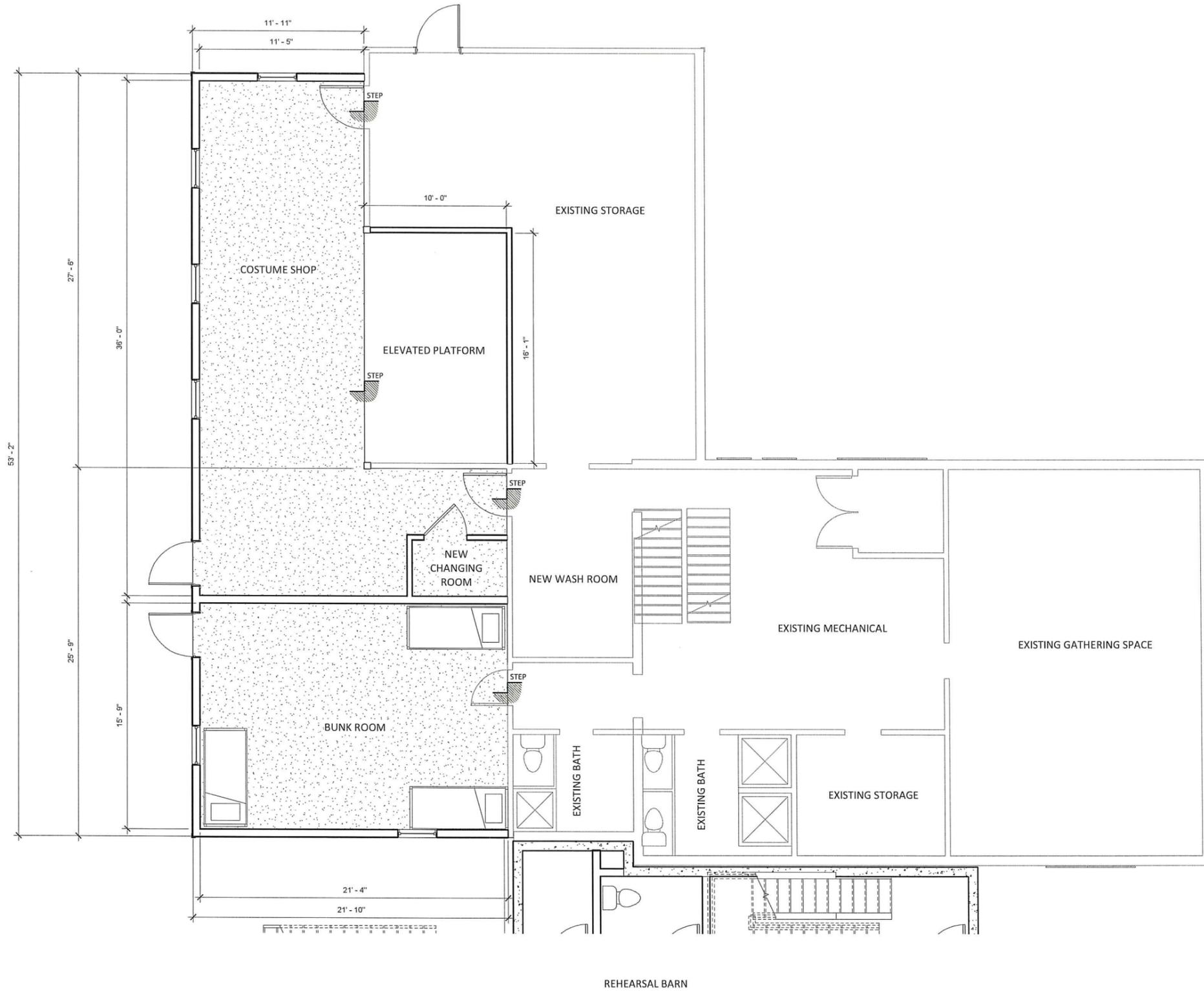
1 BARN PLAYHOUSE LOWER LEVEL PLAN
 SCALE: 1/4" = 1'-0"

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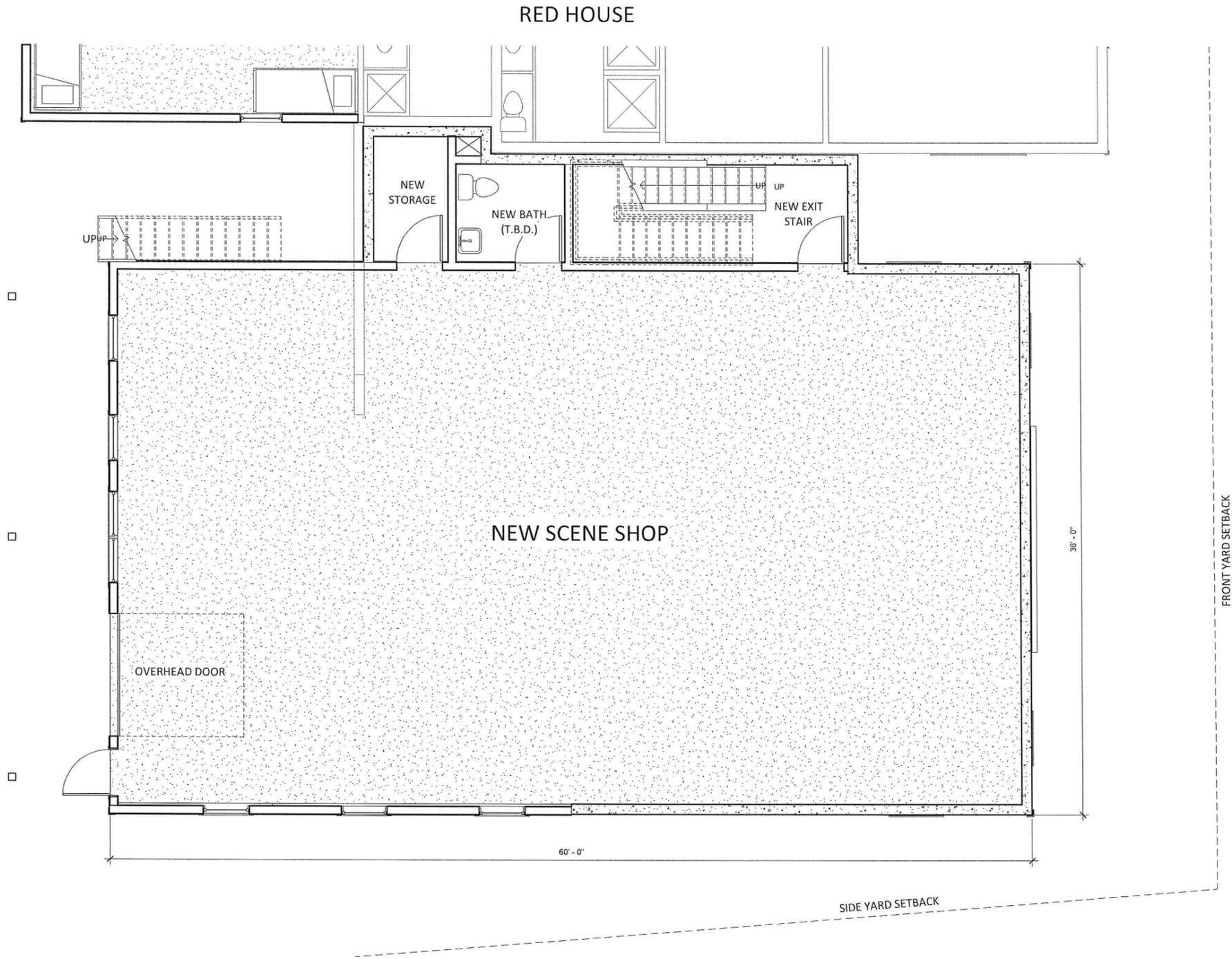
1 RED HOUSE MAIN FLOOR
SCALE: 1/4" = 1'-0"

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1 RED HOUSE LOWER LEVEL
SCALE: 1/4" = 1'-0"

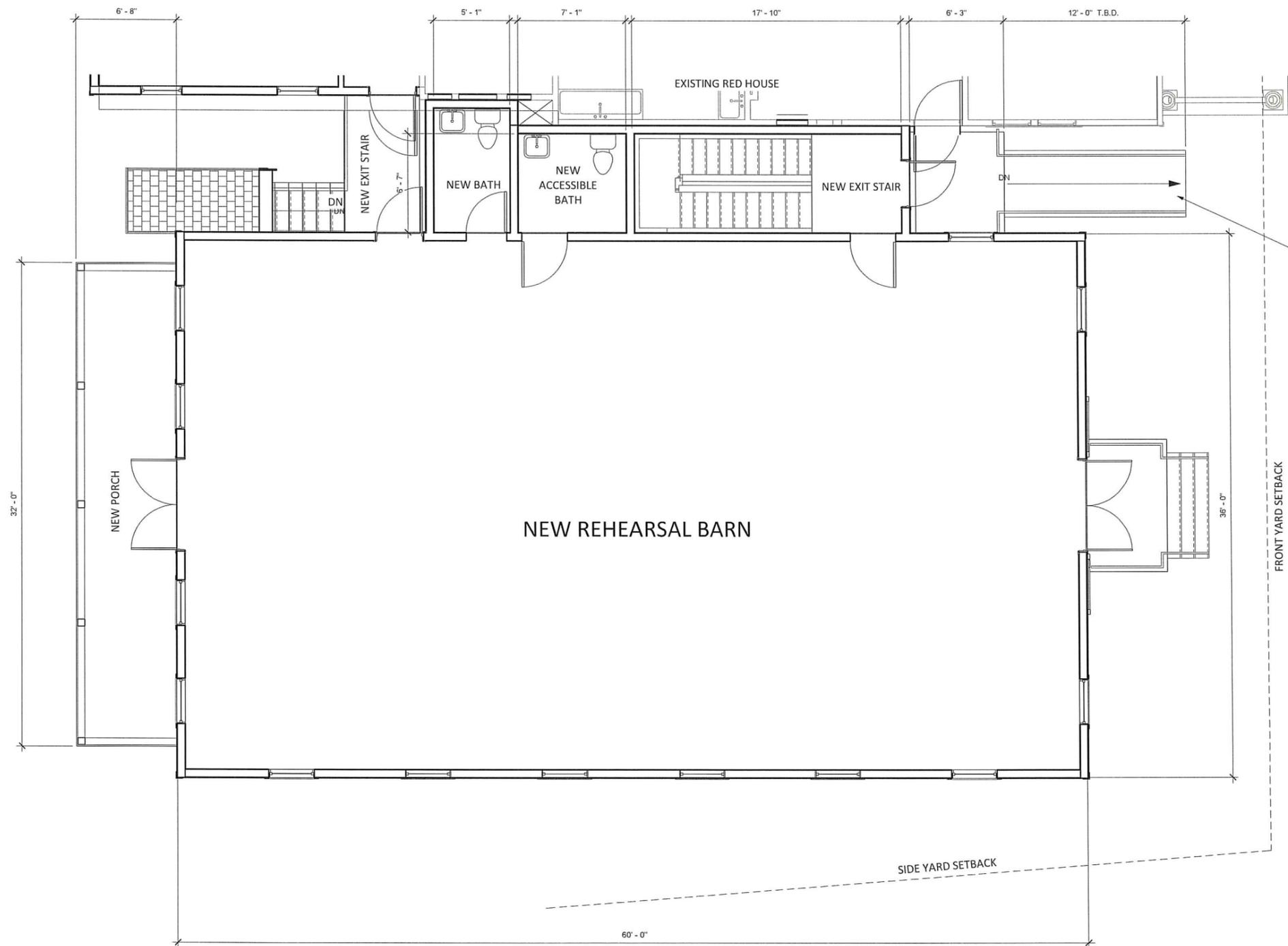
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1 REHEARSAL LOWER LEVEL
 SCALE: 1/4" = 1'-0"

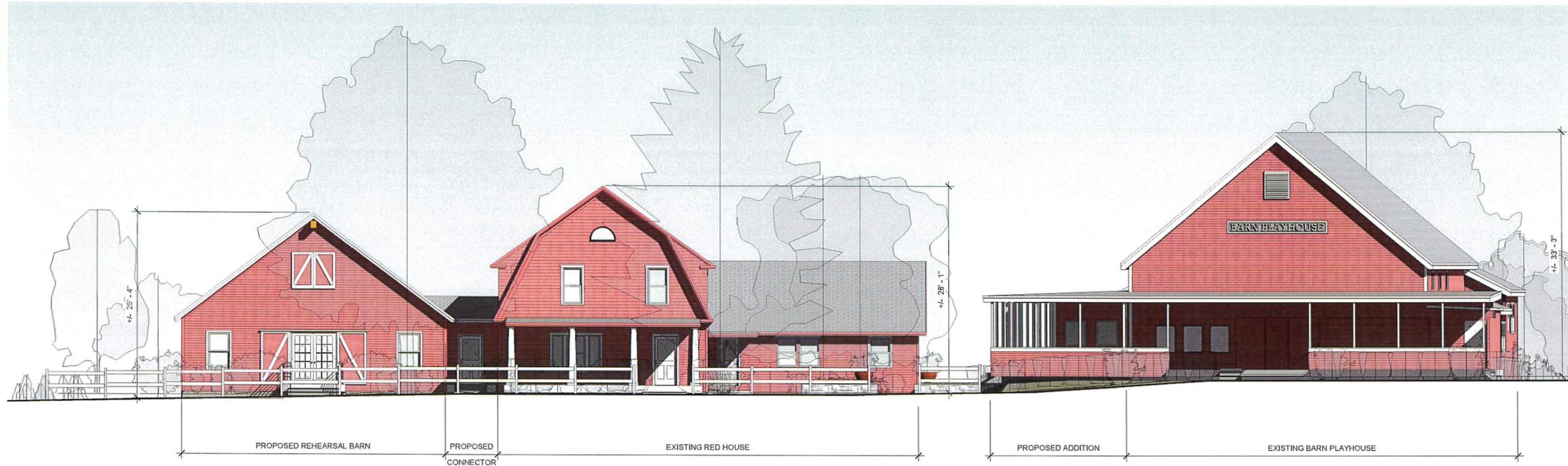
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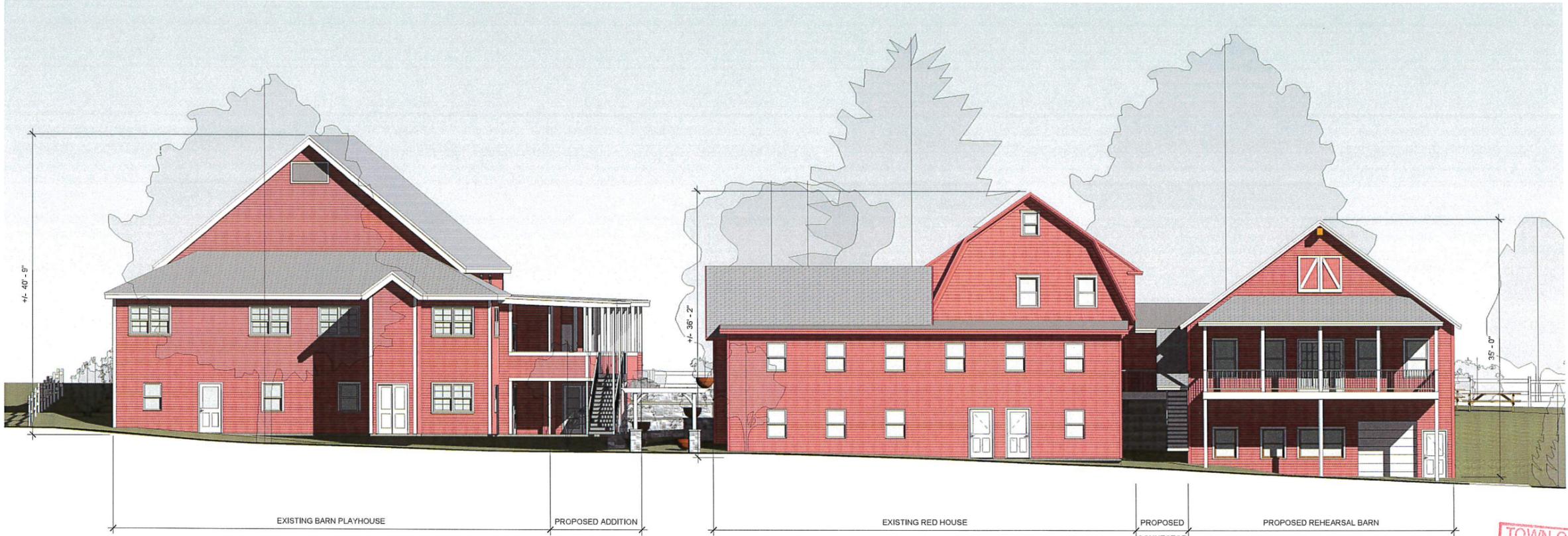


1 REHEARSAL MAIN FLOOR
SCALE: 1/4" = 1'-0"

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1 MAIN STREET ELEVATION
SCALE: 1/8" = 1'-0"



2 PARKING LOT ELEVATION
SCALE: 1/8" = 1'-0"

GENERAL NOTES
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ISSUED FOR:
SITE PLAN APPROVAL

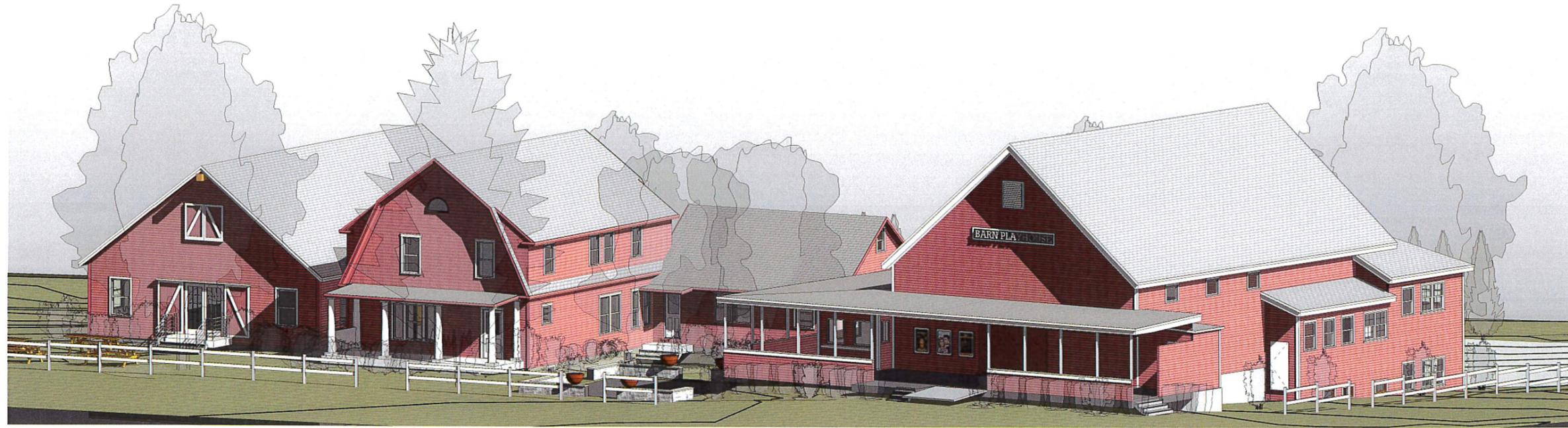
NEW LONDON BARN
PLAYHOUSE, INC.

BARN PLAYHOUSE
EXTERIOR

Project Number:
Date:
Scale:
Sheet:

A-2

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1 FRONT PERSPECTIVE
SCALE:

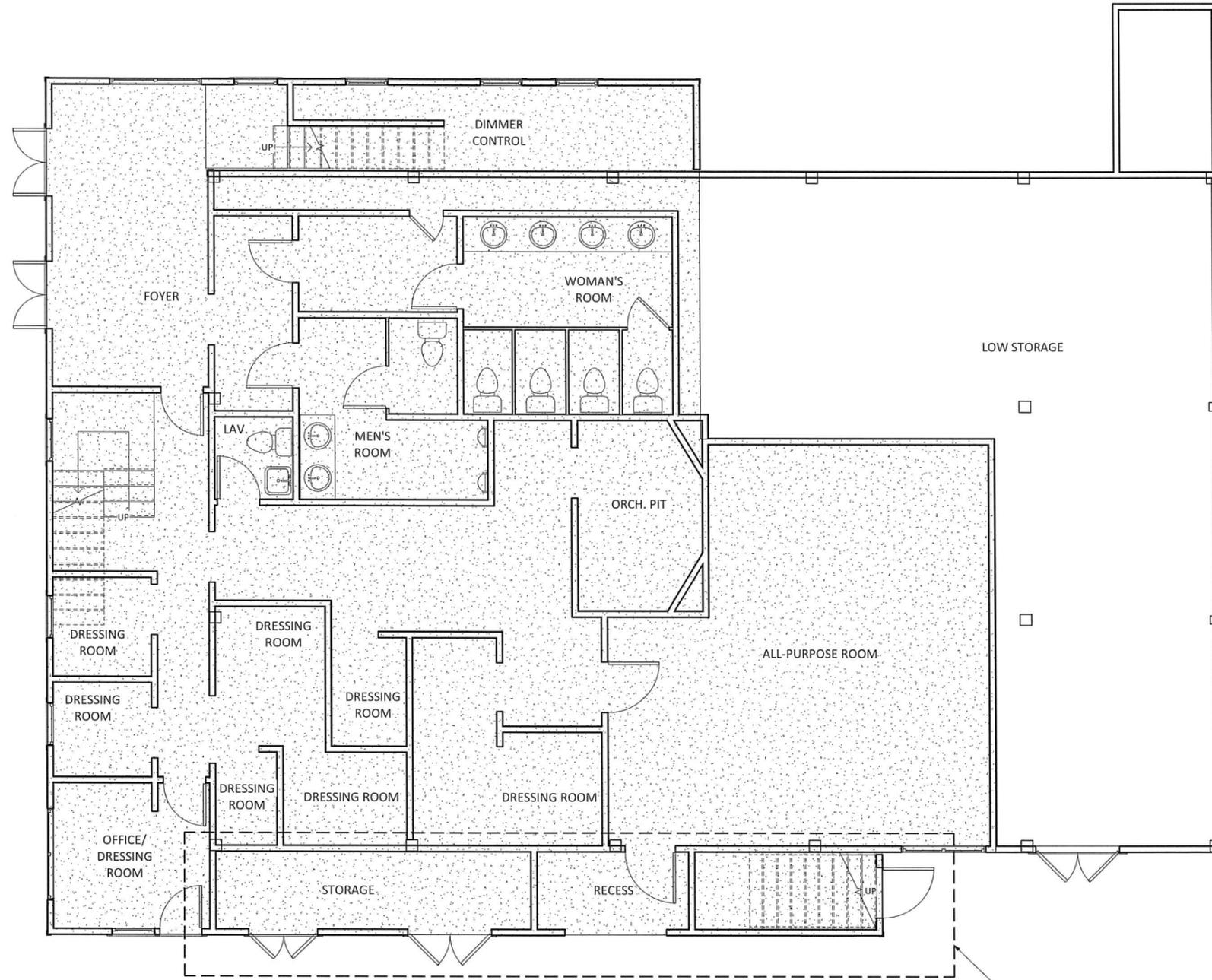


2 REAR PERSPECTIVE
SCALE:

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EXISTING LOWER LEVEL
 SCALE: 1/4" = 1'-0"

AREA TO BE DEMOLISHED

GENERAL NOTES
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 SITE BY AN APPROVAL

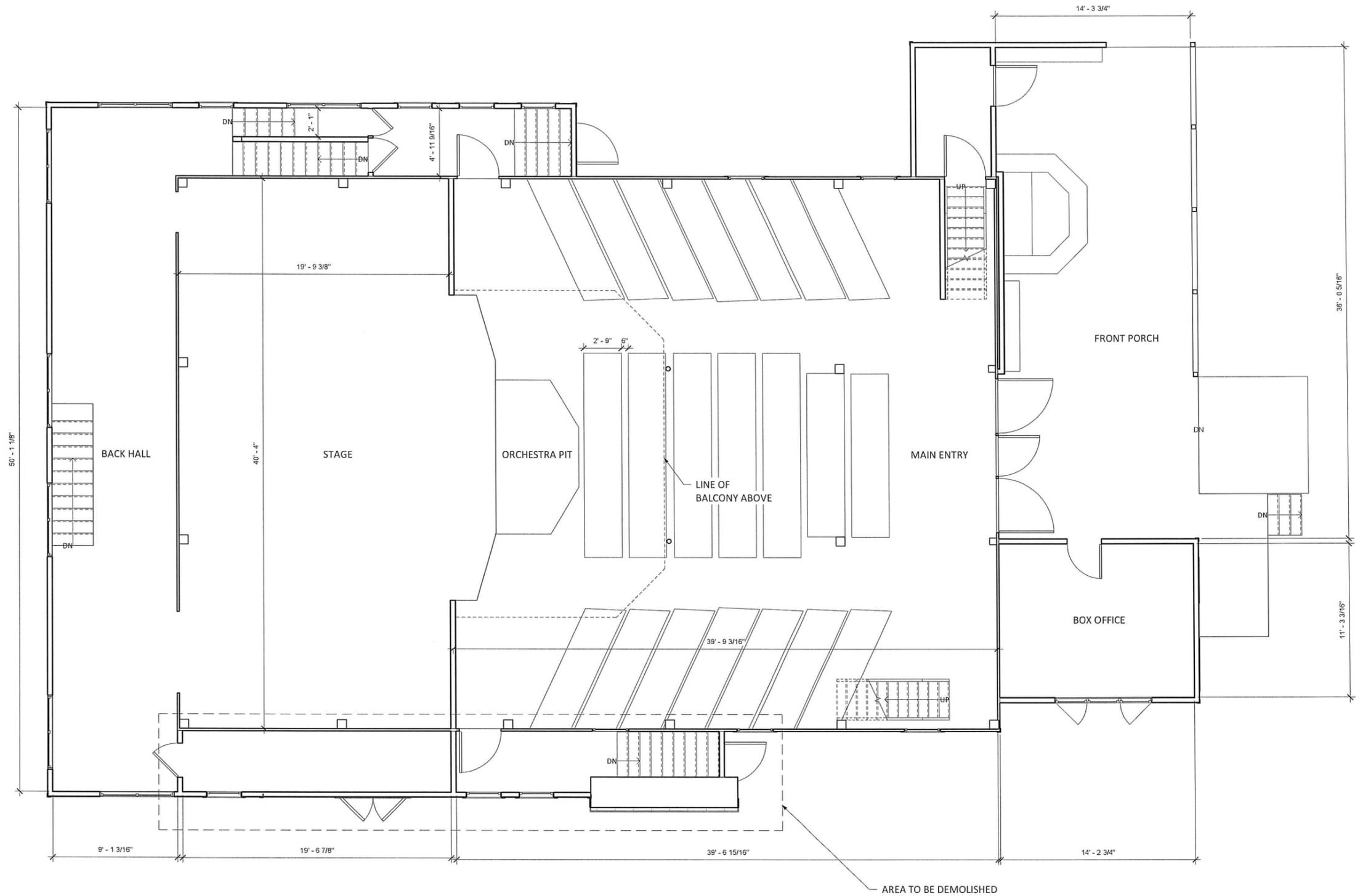
NEW LONDON BARN PLAYHOUSE, INC.

BARN PLAY HOUSE EXISTING

Project Number:
 Date:
 Scale:
 Sheet:

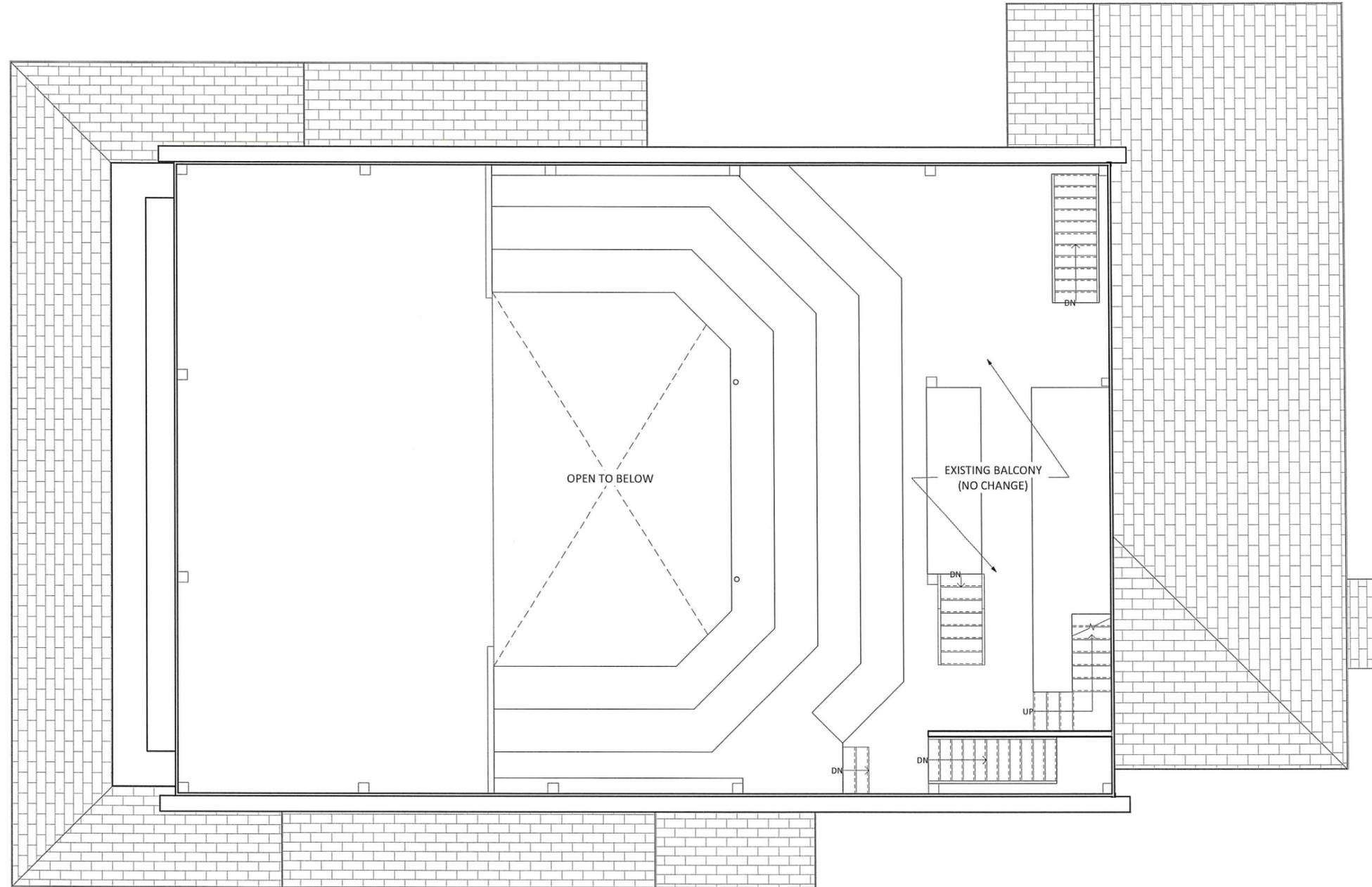
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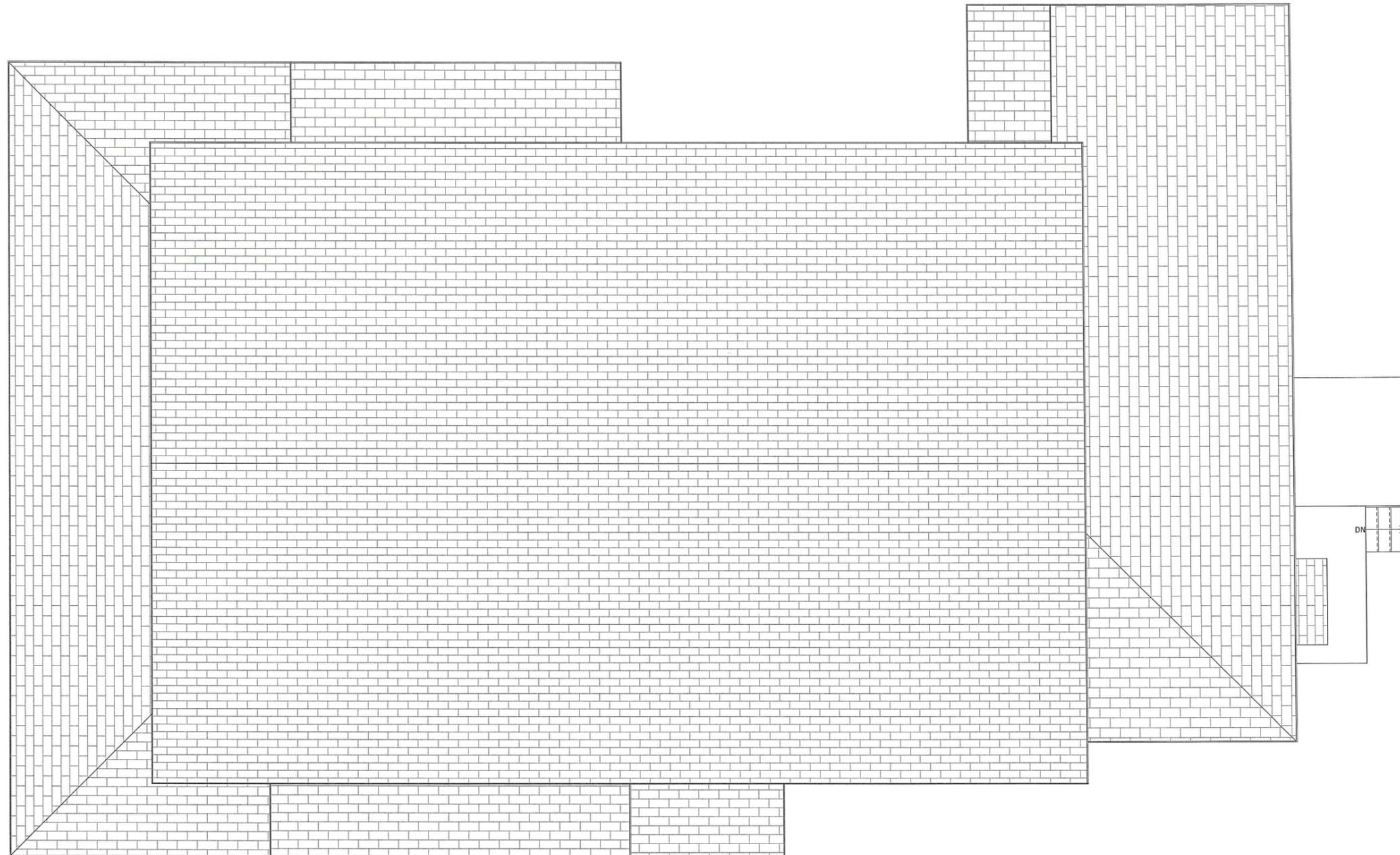
1 EXISTING FIRST FLOOR
SCALE: 1/4" = 1'-0"

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1 EXISTING BALCONY PLAN
SCALE: 1/4" = 1'-0"

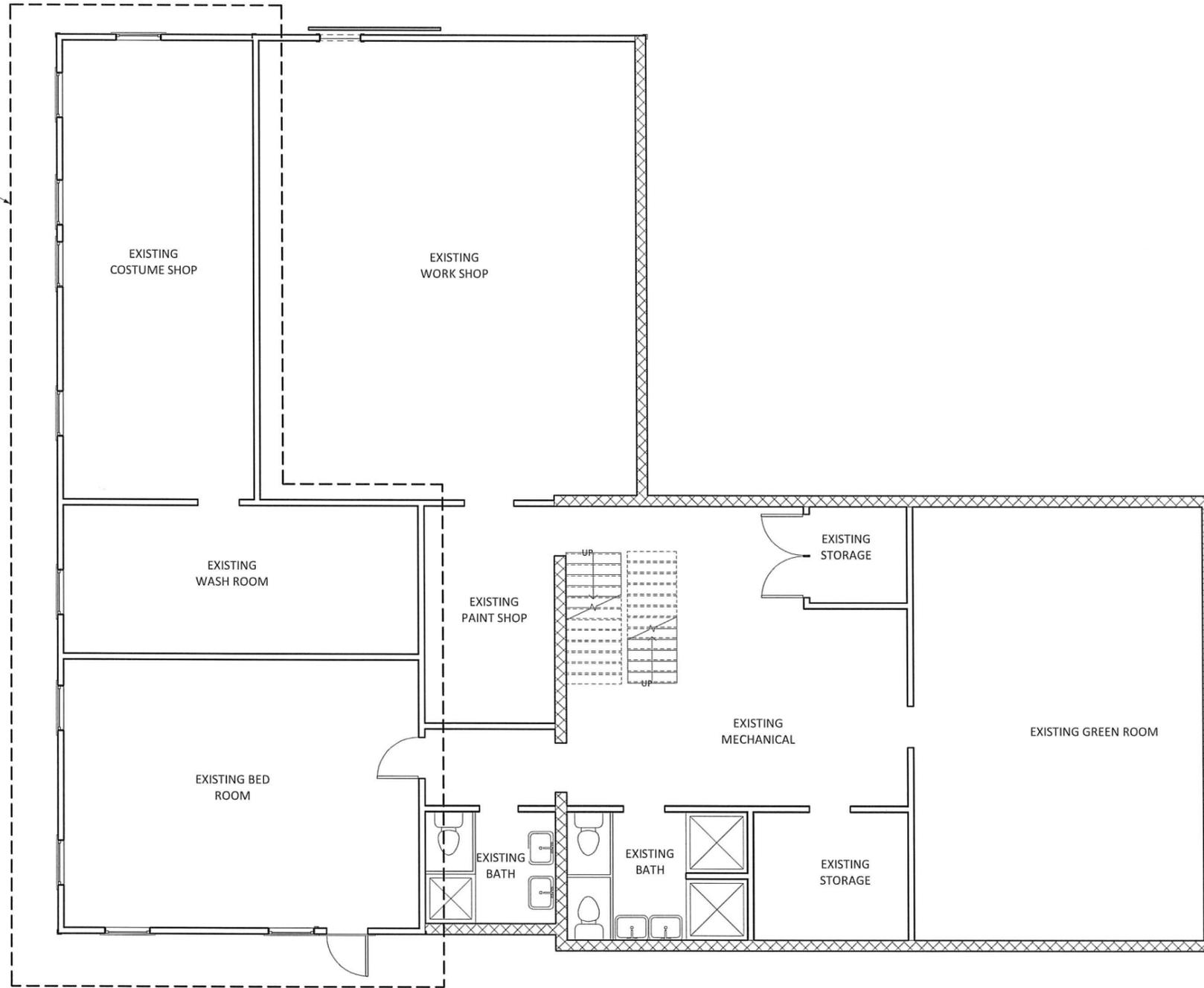
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1 EXISTING ROOF PLAN
SCALE: 1/4" = 1'-0"

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AREA TO BE DEMOLISHED



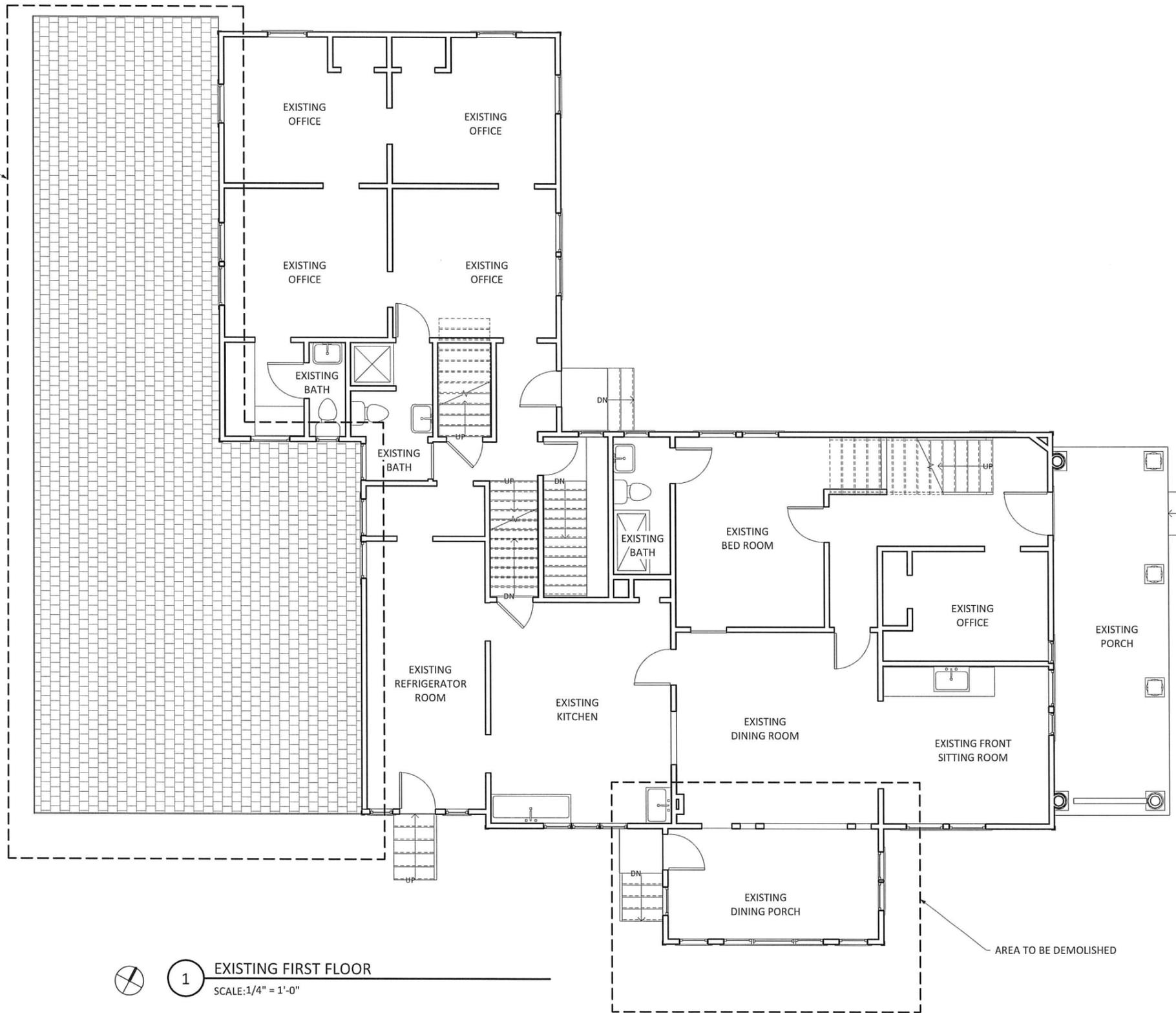
1

EXISTING LOWER LEVEL

SCALE: 1/4" = 1'-0"

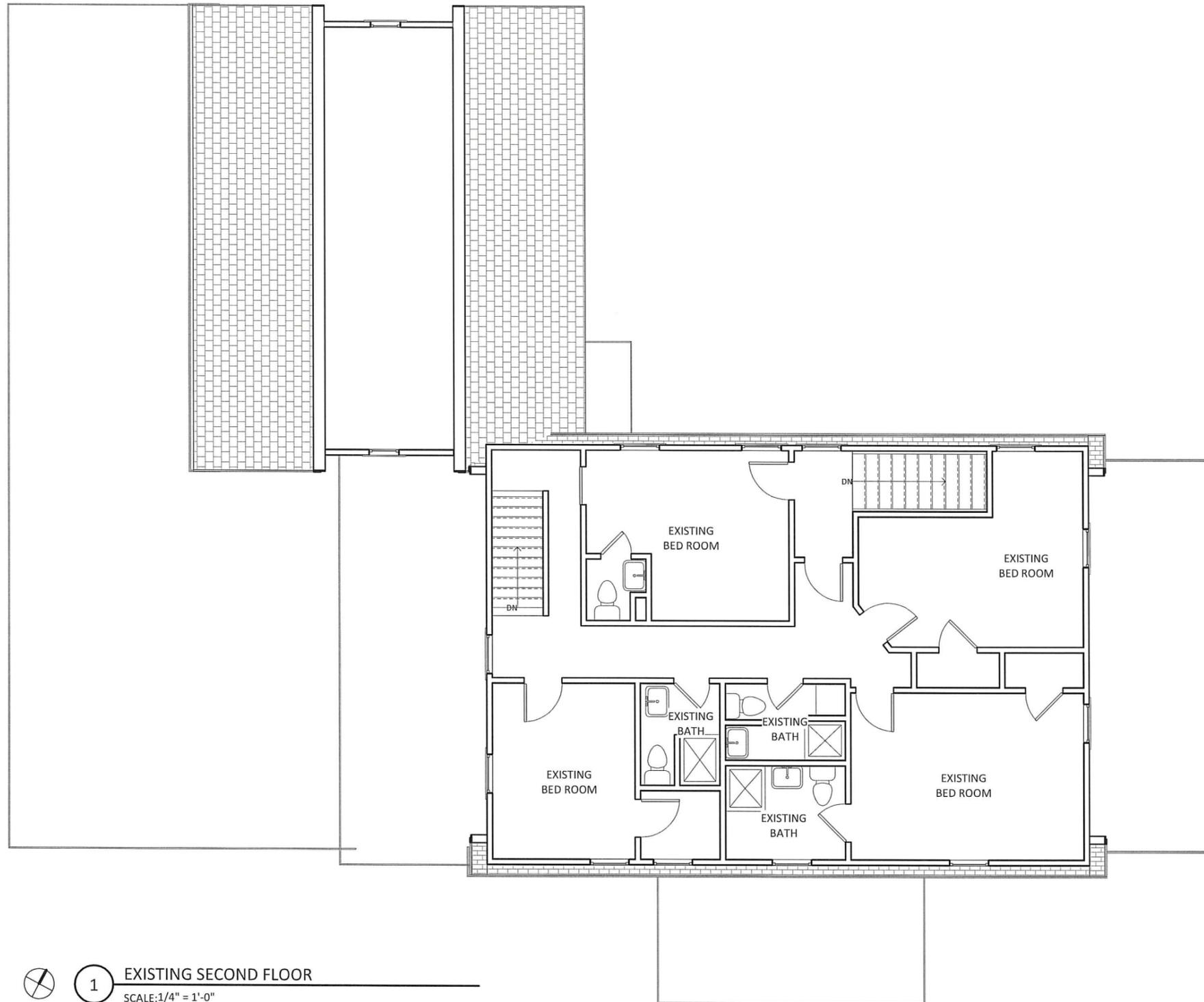
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AREA TO BE DEMOLISHED



1 EXISTING FIRST FLOOR
SCALE: 1/4" = 1'-0"

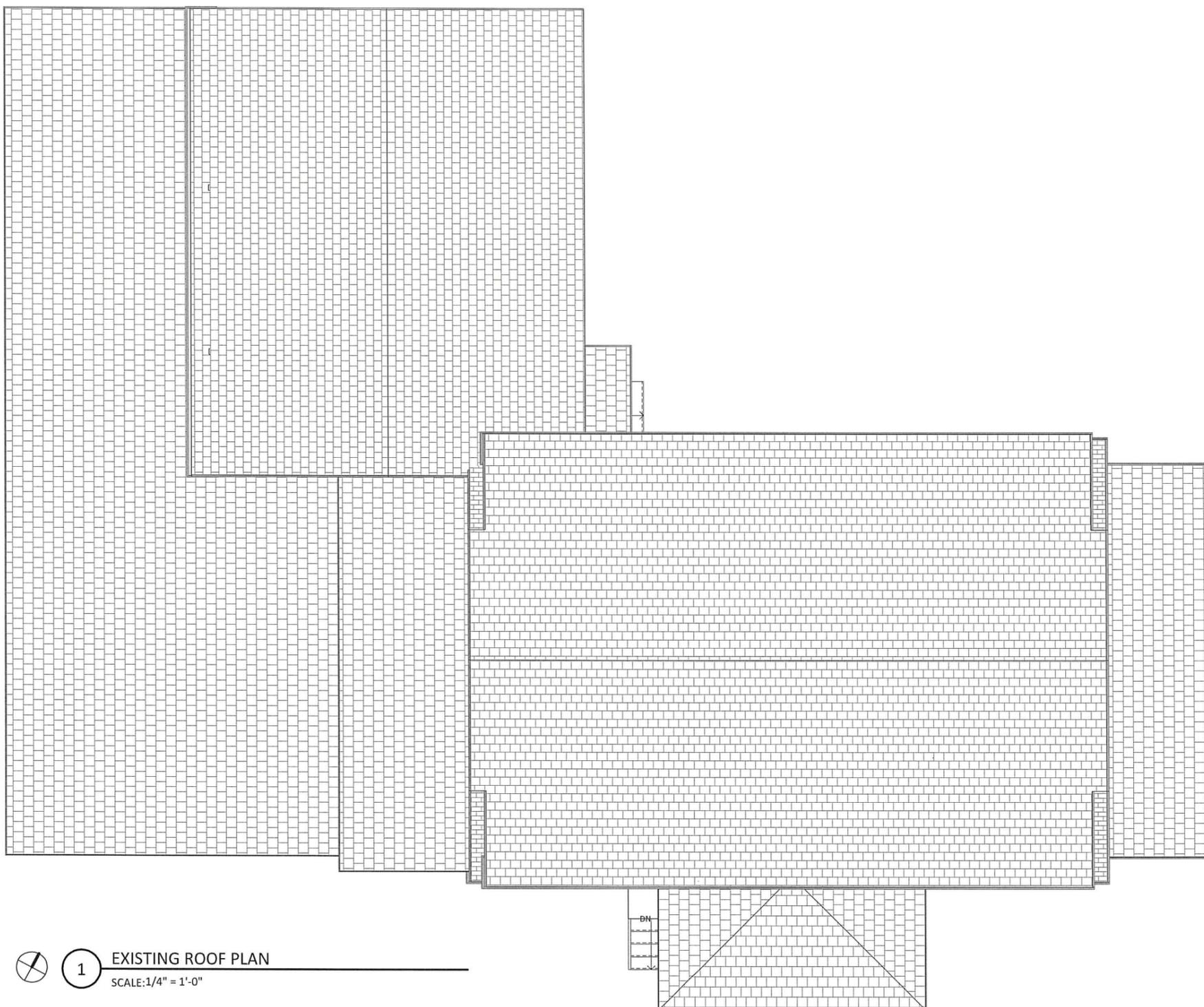
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F. J. J. J.




1 EXISTING SECOND FLOOR
 SCALE: 1/4" = 1'-0"

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1

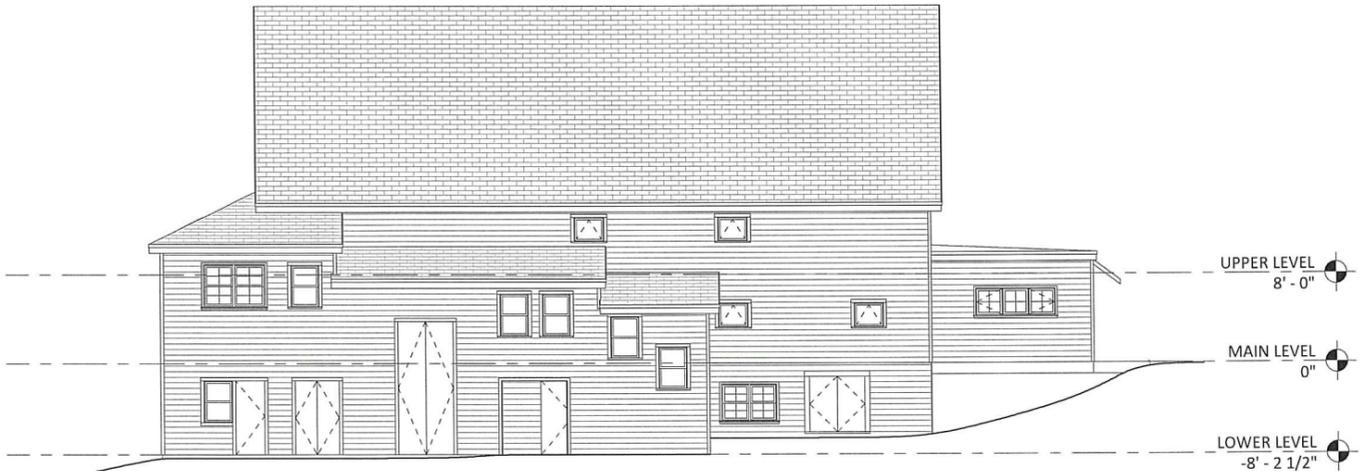
EXISTING ROOF PLAN

SCALE: 1/4" = 1'-0"

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OCT 01 2019



1 EXISTING EAST ELEVATION
SCALE: 1/8" = 1'-0"



2 EXISTING SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



3 EXISTING NORTH ELEVATION
SCALE: 1/8" = 1'-0"



4 EXISTING WEST ELEVATION
SCALE: 1/8" = 1'-0"

TO:
SELECTIVE
OCT 01 2019
RECEIVED



2 EXISTING EAST ELEVATION
SCALE: 1/8" = 1'-0"



3 EXISTING SOUTH ELEVATION
SCALE: 1/8" = 1'-0"



1 EXISTING NORTH ELEVATION
SCALE: 1/8" = 1'-0"



4 EXISTING WEST ELEVATION
SCALE: 1/8" = 1'-0"

TOWN OF NEW LONDON
SELECTMEN'S OFFICE
OCT 01 2019
RECEIVED